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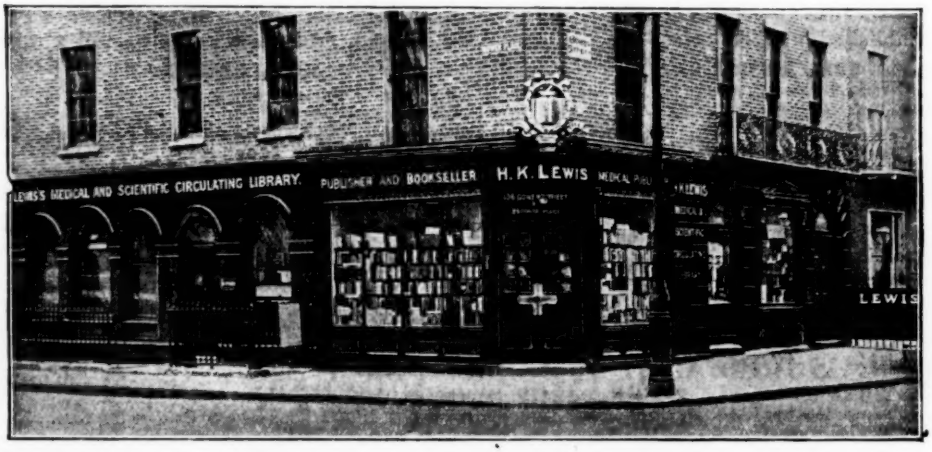

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INTRODUCTORY.

THE aim of the special medical examination is to select from amongst civilians, cadets, and officers those who are constitutionally fit, or who appear to be fit, for flying duties. In order to arrive at correct decisions fitness for his work is also necessary in the examiner. Unfitness on his part may lead to two undesirable results: first, candidates who are physically fit may be rejected; and, secondly, candidates who are physically unfit may be passed. There is no doubt that in the past the flying services suffered from both of these results.

It has been assumed too readily, and not by the lay public only, that it was an easy enough thing to decide as to a man's fitness for any duty. Experience in the flying service has shown that it is by no means easy to do so as regards flying work. It is impossible to estimate how many physically fit men have been rejected for the flying service. The decision depended on the examiner's skill and experience, and on the standards he had been taught or had had laid down for him. Too often these were cast-iron standards, with a fine halo of antiquity about them, but quite unsuited for present-day purposes. The employment of the same standards led to the admission of many unfit men into the flying service. These results are more serious in this service than in the case of the older services, because a flying man's training is a particularly expensive one, and when he fails or breaks down it usually means that his flying days are over for ever.

The Scope of the Examination.

There are certain things that the examiner must bear in mind. It is not the case that flying duties require special qualifications other than those called for in many branches of sport and mountaineering and in many country occupations. If, for instance, we take the public-school boy who has been captain of his football team and has held his own in the class-room we require no elaborate examination with special tests to estimate his physical fitness for flying. At the other extreme we have the civilian lad who is town-born and town-bred, whose practical experience of athletics has consisted in looking on at football matches, whose working hours have been passed in an office, and his leisure hours in the streets or a music-hall. Merely by inspection one can decide at once that he is quite unfitted for flying work. Between these two extremes there is a large intermediary class requiring careful medical examination.

The examiner should also know that the diseases and disorders of flying men are not different from those met with in the civilian population. The contrast between the two lies in this, that the causes of flying disabilities are not present in ordinary life. The results are the same in both cases. Thus air-sickness bears a very close resemblance to sea-sickness. The man who gets sea-sick when the vessel leaves port on a calm day gets very much worse when the ship is storm-tossed. The pilot who gets sick at straightforward flying gets very much worse when the plane is buffeted about by pockets of wind or when stunting is indulged in.

While it is extremely desirable that the examiner should know how the causes of flying disorders will affect the candidate before him that knowledge is not yet forthcoming. It is asking too much of the examiner at the present stage of flying to expect him to recognise the proper flying temperament or any inherent tendency to develop disabilities in the air. What he should concentrate on is the selection of those only who are physically and mentally fit. The rest is guess-work.

Special Tests.

Attempts have been made both in this country and in America to standardise the examination by means of fixed tests. Some would allow the tests, or even a single test, to dominate and decide the examination. So far, however, no tests have been found which can be accepted as reliable, and most of them require much more testing, especially by experience, before they can be accepted as definite standards.

One must remember how fallacious tests have proved in the past. A systolic murmur heard at the apex was for long considered an infallible test of heart disease and disability. Its presence has led to the rejection of countless fit men for army and navy service. It was only after long experience and bitter controversy that this test was recognised to be of no value in deciding as to the condition of a man's heart. It was useful in calling for a careful examination of the heart, of the significance of the murmur, and of the presence or absence of any associated cardiac lesion or functional disability. This is the value of all special tests, that they direct one's attention to certain organs or functions which require specially careful examination. For this purpose they are to be welcomed and used as finger-posts, but not to be regarded as impassable barriers.

Guiding Principles.

Instead of endeavouring to standardise the tests I think that an attempt might be made to standardise the examiners. If certain guiding principles were drawn up and accepted the carrying out of these principles would bring all the examiners into line. If the examiners viewed the medical problems involved from the same standpoint the results of the examination would tend to be uniform.

In the following pages certain broad principles are suggested, as the result of my experience, which may serve as a guide to the medical examiner who is beginning this work. The examiner does not start with an aptitude for assessing the fitness of a candidate for air duties. It has been my experience and that of most trained examiners I have talked to, that a somewhat long and arduous apprenticeship has been necessary before a decision can be given with confidence. That has been partly due to the fact that we had no guiding principles and that the problems set were entirely new. This period of apprenticeship will be considerably shortened if the examiners are agreed about the principles of examination and the standards to be adopted, and can convey them to those who are beginners.

It is not advisable for the examiner to bring too many preconceived ideas with him on commencing this work. He may in the course of his professional work have acquired certain views which have not been submitted to the criticism and judgment of his compeers. He may feel inclined to reject or to pass a candidate on grounds which would not commend themselves to other examiners. Such views and such decisions may usefully form a subject for discussion at the Examiners' Board, but should not be carried out in practice at an early stage of the work. On the other hand, the new examiner is perfectly justified in declining to allow his judgment to be over-ruled because of some test, with an authoritative name attached, or because of some scientific toy which is stated to be an automatic pilot-finder. He is perfectly entitled to demand some definite proof of the validity of all such tests, and some more evidence of their value than that of the name behind them, or the fact that they are said to be amongst the latest scientific discoveries.

Essential Qualifications for Air Service.

The examiner must consider what are the special duties and dangers which will be experienced in a flying career. A pilot will have to carry out his duties in a new element, or at least in one which varies much in its composition from the stable atmosphere he has been accustomed to live and work in. He will have to acquire the complete control of a car moving through space in such a way that all his controlling movements become as automatic and unconscious as those of an expert bicycle-rider. He has, further, to be prepared for active fighting in the air, the attacking of enemy air-craft, and the protection of his own aeroplane and of his own life. No small requirements these.

From the medical standpoint I consider that there are certain necessary qualifications to meet these conditions successfully, or at least with the prospect of success. The first is a good physique; then comes a sound cardio-vascular system; and, lastly, a strong and stable nervous system. These are the essential qualifications required to meet the special conditions of the air service, on the principle that where the strain falls the resisting power must be strong.

The necessity for these qualifications is not based on theoretical considerations only. Practical experience at the Invaliding Board of pupils under instruction who have failed, and of officers who have broken down from accidents, or stress of service, or inability to continue flying, has supplied strong confirmatory evidence. The symptoms complained of are numerous and various, such as fainting, giddiness, loss of consciousness, loss of control, exhaustion, headache, sleeplessness, loss of confidence, &c. An examination of those who present such symptoms and who are not suffering from active illness or gross injury shows that there has been usually an exhaustion or a giving out of the cardio-vascular or the nervous system. This is the outstanding fact in the vast majority of cases, and it is an indication to the examiner that he will do well to concentrate on these two systems in determining the fitness of a candidate for the flying service.

The examiner should bear in mind that while he has to exclude candidates with gross disease of a disqualifying kind it is not from gross disease that the flying men break down and become useless. Apart from the direct injuries or wounds of the service and the effects of previous or recent illness, it is functional disabilities which bring flying men before invaliding boards and which swell the numbers of the "permanently unfit for further flying." Some organ or some system has given out and the flying power has gone, although the officer may be perfectly fit for general service on the ground. It is this tendency to functional disability and the importance it assumes in flying work that the examiner must remember. His duty is to seek out and discover, if possible, any such tendency. Sufficient evidence of its presence may be obtained in the previous history of the candidate or in the medical examination carried out on the above lines.

Limitations of the Examination.

The examiner will also bear in mind the limitations of his examination. It is primarily and essentially a medical examination to determine physical fitness. It is not expected that the examiner will be able to pick out the future cream of airmen at this early stage, any more than at an entrance examination at the university the future leaders of the medical profession are to be recognised. The examiner passes all those who come up to his standard of physical fitness and leaves to the future training and experience the development of the individual's flying ability.

As already stated, the examiner must not be expected to decide as to which candidates have "the flying temperament" and which have not. It may be apparent at once, but, on the other hand, it is an elusive qualification and may be entirely latent until developed under actual flying experiences. Attempts to determine at the examination as to what heights the candidates should fly and what line of flying work he is best suited for are, to say the least, premature. These questions can be settled only with knowledge and precision as the result of training and experience.

The mentality of the candidate must be considered, but a low grade does not disqualify unless the examiner considers that it is so low as to amount to mental defect or deficiency. The quick, alert examiner must not mistake the slow cautious youth for an imbecile. The mental calibre, if not up to flying duties, will be sufficiently tested at the examinations which the candidate has yet to pass as a cadet before entering on actual flying, and to that test the medical examiner may safely leave the doubtful cases.

Points to be Determined.

A careful examination must be made to determine the presence of any gross or disqualifying disease. That applies in every medical examination, and the candidates must be found "fit for general service."

Over and above this the examiner has to try to determine how the important vital organs and tissues are doing their work and how they are likely to respond to conditions of stress and strain. From his examination of the human machine at rest and under ordinary conditions he has to attempt to gauge how the mechanism will work under entirely different and much more strenuous conditions. It is not a question merely as to the sounds and size of the heart, but how the whole cardio-vascular system is to stand strain and what are its reserve powers. It is not a question of percussion resonance, or breath sounds about the lungs, but how efficiently the respiratory functions will be carried out in the flying sphere. Above all, has the candidate a nervous system which is strong and stable in itself and over which he can exercise control under novel and trying experiences?

This determination of the functional powers and of the reserve powers of the vital organs is difficult, but it is the chief problem which the examiner must try to settle. He must find out wherein the candidate is weak and wherein he is strong. It is in this connexion that single and standard tests fail, because their significance as regards the candidate's functional powers has not yet been ascertained.

The examiner has to form his decision on purely medical grounds. While appreciating a candidate's keenness to become a flying officer, which may tend to cloud his memory as to some points in his medical history, the examiner must not allow such keenness to counterbalance any evidence of physical disability. While dealing courteously with any special influences from the powers that be in favour of a particular candidate, he must not allow any such influence to affect his judgment or decision. An examiner recognising his professional responsibility in deciding on the fitness of a candidate for the arduous duties of the air service should give his decision without fear and without favour.

PREVIOUS HEALTH AND ILLNESSES.

The importance of a careful investigation into the previous health and illnesses of a candidate cannot be overestimated. No examiner, however experienced, can deal sucessfully with his work if he omits this, and bases his opinion solely on tests and physical examination. It may be said that the candidate will conceal important facts in his eagerness to be passed, and many do. But with the examiner noting down his replies and cross-examining him the truth will be elicited in the majority of cases. In this inquiry also stress is to be laid on a history of special symptoms, which may be of importance in directing attention to particular organs in the physical examination which is to follow, or may be of such importance as to render the candidate unfit for flying.

The examiner, for his own guidance, might lay down some such rule as the following: Any form of constitutional or acquired disability which has rendered, or which may render, the candidate liable to attacks of loss of consciousness, lapses of memory (mind a blank), fainting, loss of vision (hemianopia, temporary amblyopia), or prostrating headache should be a definite cause of rejection.

As regards special diseases the following list comprises those about which particular inquiry should be made: Asthma, malaria, syphilis, rheumatic fever and chorea, digestive disturbances, migraine, petit mal, epilepsy, nervous debility, neurasthenia, shell shock, concussion with unconsciousness, chronic joint disease (especially of the knee), and the diseases of active foreign service. Several of these form an absolute bar to acceptance, while others must be considered from the point of view as to whether recovery has been complete or not.

The complete examination of the flying candidate requires an investigation as to his fitness from a general surgical standpoint. A special examination must also be made as to the condition of the eyes, nose, ear, and throat. The candidate's vision must be tested, and this is the only part of the examination where definite standards have to be employed. It is to be hoped that the standard of normal binocular vision will soon be established. The examination of the ear, including the labyrinth, brings up the question of vertigo and balancing. On this subject my colleague, Mr. Arthur Cheatle, has introduced various testing exercises, which are useful not only as bearing on labyrinthine efficiency but also as indications as to the nervous tone and stability generally.

The internal organs must be examined in order to exclude organic disease and to test their functional activity. We shall consider more particularly the two most important systems—namely, the cardio-vascular and the nervous.

THE CARDIO-VASCULAR SYSTEM.

Our system of examination here proceeds on somewhat different lines from those of the naval and army services. Under the term cardio-vascular system are included the heart, the arteries, the veins, and the capillaries. Two entirely separate abnormalities are recognised—namely, organic disease and cardio-vascular debility.

I.—ORGANIC DISEASE OF THE HEART AND BLOOD-VESSELS.

Cardiac Murmurs.

Organic disease of the heart is not common amongst candidates, but none the less it must be carefully examined for. The definitely disqualifying lesions, which are generally accepted in all the services, are mitral stenosis, as shown by a presystolic murmur at the apex, and aortic regurgitation, as shown by a diastolic murmur at the base. Expressing this in another way, one may say that a definite murmur occurring during the period of diastole is a cause for rejection. It is not necessary to discuss why these lesions should be viewed so gravely, because medical opinion seems for once to be unanimous on the subject. As regards our own experience amongst candidates previously examined we have found a tendency to diagnose a mitral presystolic murmur when it was not there and to overlook an aortic diastolic murmur when it was present.

Apart from these two conditions, little attention is paid to murmurs, systolic in time, which are heard about the præcordia, unless they are the result of rheumatic fever or are accompanied by definite pathological changes in the heart. A healthy youth who has never had rheumatic fever and who has never had any cardiac symptoms is not to be rejected because a systolic whiff or murmur is heard about the apex or the base. In the majority of the young candidates a careful examiner will detect a systolic murmur, with its maximum intensity over the pulmonic area; this is regarded as physiological and not pathological. A basal systolic murmur due to aortic stenosis is very rare—no case has occurred in my experience—and this lesion should not be diagnosed in the absence of clear evidence of hypertrophy of the left ventricle.

If a systolic murmur is present at the apex and is regarded as due to mitral regurgitation, and if there is a history of rheumatic fever, it will probably be advisable to reject the candidate. This decision would not be based solely on the mitral lesion, but also on the tendency to recurrence of the rheumatic disease. If a systolic murmur at the apex is regarded as due to mitral regurgitation, in the absence of a history of rheumatism we base our verdict on the presence or absence of any changes in the heart as the result of the mitral lesion. If the heart is not enlarged, or hypertrophied, as regards the right or the left ventricle, and if the sounds there are clear, and if the candidate has had no symptoms of cardiac disability, he may be regarded as possessing a functionally sound heart. In other words, a mitral lesion is weighed according to the effect it has produced on the musculature of the heart and the heart's efficiency, and if no effect can be detected the cardiac lesion may be ignored.

Cardiac Irregularity.

Cardiac irregularity is not to be regarded as an indication of cardiac disease. The most of the irregularities met with amongst candidates are not associated with any form of heart disease.

The most common form is "the youthful type of irregularity," a sinus irregularity which manifests itself by a quickening of the cardiac rate during inspiration, and a slowing during expiration. Every examiner should make himself familiar with this type of irregularity, which is extremely common amongst candidates, and has in the past been a common cause of rejection for the public services. This irregularity is of no significance or importance.

The occurrence of extrasystoles or premature contractions is another not uncommon form of heart irregularity, and is usually manifested by an occasional "missed beat" discovered while one is auscultating the heart or feeling the pulse. This form of irregularity is of no importance taken by itself. If the candidate is conscious of the "missed beat" and says he can feel his heart stop and go on again, he probably has that sensitive type of nervous system which is potentially neurasthenic.

In practice no candidate is rejected for any form of sinus irregularity or because of the presence of occasional extrasystoles. The more important forms of cardiac irregularity usually associated with an abnormal rhythm of the heart, such as auricular fibrillation or auricular flutter, heart-block, &c., are very rarely met with, but are to be regarded as evidence of disqualifying heart disease. Any form of paroxysmal tachycardia is a cause for rejection.

Area of Cardiac Dullness.

If there is marked dilatation of the heart with a persistently rapid rate there is probably serious myocardial disease or infection, and the candidate should be rejected. A slight alteration in size or shape from what is usually described as "the normal heart" must not be unduly emphasised. Candidates are not to be rejected because the apex beat is on or a little outside the nipple line, or because the normal area of cardiac dullness is slightly enlarged. At the age the candidates present themselves such variations in the size of the heart are common and are not of themselves of any special importance. On the other hand, cardiac hypertrophy, usually associated with dilatation, is always pathological. If there is a definitely heaving action of the right or left ventricle, a cause for this must be looked for, and full consideration given to the underlying cause and its probable effects. Dilatation of the heart must not be confused with displacement of the heart. In many cases the apex beat may be found outside the nipple line when the candidate is standing, and drops back within that line when he lies down.

The Arteries.

Organic disease of the arteries in the form of arteriosclerosis is not often met with; it is sometimes present in the older candidates. Arterial thickening, with or without tortuosity of the vessels, is probably always the result of some form of toxæmia. If associated with renal disease or retinal changes, or cardiac changes, or definite symptoms, it is clearly a cause for rejection. If it is present without any other evidence of disease, and the candidate is physically sound, he may be accepted.

A high systolic blood pressure—namely, 130 to 150, as estimated by the sphygmometer—is often found amongst candidates, and is not of itself a cause for rejection. If the examiner considers the blood pressure too high at systole or too low during diastole, or that the "pulse pressure" is unsatisfactory he must not reject the candidate on any one of these grounds unless he finds symptoms or signs of organic disease of the heart or blood-vessels. Striking variations in the sphygmomanometric reading are met with in connexion with cardio-vascular debility and in the absence of any organic disease.

II.—CARDIO-VASCULAR DEBILITY (C.V.D.).

This is a condition which has come to occupy a position of great importance in the examination of flying candidates. As a clinical entity it may be said to have established itself owing to the war, but there is no agreement as to the underlying cause or causes of the condition. We shall therefore deal with it from a clinical point of view.

In determining the symptoms and signs and their importance we have derived evidence from two sources—namely, (1) the condition as it is met with in civil life; and (2) the condition as it is met with in the case of flying officers who have broken down with similar signs and symptoms. A study of these two conditions will help one in determining the presence of cardio-vascular debility in candidates.

Clinical Experience in Civil Life.

In civilian practice clinical experience has marked out a type of individual characterised by certain cardio-vascular phenomena, present more especially during youth, but persisting in many cases through life. There is a tendency to breathlessness, to præcordial pain, to faintness or fainting, and to a rapid and thumping action of the heart under slight provocation. The faintness is often induced by a change of posture from the horizontal to the vertical, as on rising in the morning. The subject of this condition is in a chronic state of tiredness, and slight exertion soon brings on a feeling of exhaustion. Active games or heated rooms bring giddiness, fainting, or vomiting. He will state that he suffers from "a weak circulation," that his hands and feet are usually cold, that he has chilblains in winter, and that he stands cold weather badly.

On examination we find no evidence of organic heart disease. There may be an exaggerated sinus (respiratory) irregularity, or a rapid action of the heart, or some dilatation, or systolic murmurs heard over the præcordia. The pulse is a poor one in the sense that the tension is badly sustained. There may be exaggerated pulsation in the large vessels of the neck and in the abdominal aorta. The peripheral circulation is defective, as shown by the dusky

and cold hands and lobes of the ear. There is a tendency to venous plethora, which is present also in the large abdominal veins. Functional albuminuria of the postural type—that is to say, due to a change from the recumbent to the erect position—is often present.

These are some of the chief features of cardio-vascular debility as we have recognised it in civilian life.

Cardio-vascular Debility in the Flying Man.

Let us turn now to the symptoms and signs presented by flying men who have broken down under instruction, or as the result of a minor crash, or during active service.

Amongst the common symptoms are tiredness and a sense of exhaustion easily induced by any exercise, faintness, giddiness, blurring of the vision, headache, rapid action of the heart and palpitation, præcordial pain, and breathlessness on exertion. In a large number of these cases we shall find the evidences of a defective circulation which we have described in our civilian type.

It is not necessary to assume that all these conditions are the result of a flying career, or that they denote any special aerial malign influence on a healthy individual. Rather should we infer that the new surroundings and stress had acted on an individual already possessed of cardio-vascular debility, in a more or less latent form, so as to bring out the symptoms in a striking and disqualifying way. Those who have been engaged in the study of a similar (if not identical) condition known as "soldiers' heart" (D.A.H.) have been struck by the same fact. Hume and Parkinson have found that in a large number of cases of D.A.H. symptoms of a similar kind had existed during civilian life, and had only been intensified by army service, or intercurrent illness.

Significance of the Symptom-Complex.

It may be said that we are not dealing here with any known disease. This may be admitted, but a symptom-complex such as we are dealing with has its value. If in civil life men who have this symptom-complex are found to be limited in their activities according to the degree of its manifestations we are entitled to lay some stress on it. If in the flying service many men who break down more or less easily are found to show this symptom-complex in a marked degree, we are justified in considering it of some importance. If civilian experience and that of medical invaliding boards are to be made of practical value in the flying service it is of the greatest importance to apply them at the examination of candidates. Bearing these facts in mind the examiner will seek to determine the functional power of the cardio-vascular system in a candidate. Does it show any evidence of weakness? Will it probably be strong enough to stand the causes of disturbance associated with air work, or will it probably break down under the strain?

The results of the inquiry into the candidate's previous health as to such symptoms as fainting and faintness, shortness of breath, &c., must be considered in connexion with the cardio-vascular system. The information supplied may or may not be correct, but if there has been any evidence of former cardio-vascular debility, it will usually be possible to obtain it by cross-examination. For various reasons boys who suffer from cardio-vascular debility are often sent to school with the statement that they are "delicate," or have "a weak heart," or "must not overdo games."

Examination of the Heart.

From an examination of the heart itself we learn little of its efficiency from the cardio-vascular point of view. The sounds may ring clear and true, but the cardiac action may be weak. The sounds may be blurred or reduplicated, but no evidence of a defective circulation is revealed. The apex beat may not be felt, and yet the ventricular contraction may be a powerful one. On the other hand, cardiac pulsation may strike (apparently) strongly over a considerable area of the chest wall, simply as the result of nervous excitability.

The cardiac efficiency is to be tested by its response to effort, and more especially by the degree of breathlessness induced by physical exercises. As a matter of practical experience, it may be pointed out that at the age under consideration the cardiac action is seldom inefficient, and a breakdown of myocardial contractility is not to be anticipated. The disturbances which may arise in the heart are not primarily myocardial in origin, but are most commonly nervous.

Along with other organs the muscular tissues of the heart seem to suffer secondarily under stress from a loss of tone or power, but the ordinary physical examination of the heart does not supply any definite information as to the presence or absence of this condition. While evidences of organic heart disease are absent, this type of individual shows in great variety and with great frequency systolic murmurs about the præcordia.

The Heart Rate.

A difficulty which presents itself in the case of these young candidates is that the excitement and anxiety of a medical examination leads to a rapid cardiac action. We find not uncommonly a rate of 110, 120, or 130. If this were the usual rate of the candidate's heart he would probably be rejected. As his anxiety may persist through the whole examination the increase in cardiac rate may be maintained. As very few individuals possess any control over the cardiac rate we cannot always succeed in checking the rate by calming words to the candidates.

If the increased cardiac rate is due to nervous excitement there will usually be a diminution if the candidate is placed at rest on a couch and is asked to breathe slowly and deeply. Another test employed is as follows. The candidate, lying comfortably on a couch, is asked to breathe very slowly and very deeply. The apex is then carefully auscultated for any change in rate during inspiration and expiration. If the heart rate shows a respiratory variation, more especially a definite slowing during expiration, then in all probability the excited action is not cardiac in origin, but arises from some influence outside the heart, usually nervous and temporary. The reason for this conclusion is that the slowing of the heart is vagal in origin, elicited by respiration, and such slowing does not occur in hearts quickened by myocardial disease. If, on the other hand, the cardiac rate shows no change under rest or deep respiration there is probably some permanent disturbing factor at work, such as toxæmia or latent infection. In such a case the candidate cannot be accepted and must be refused or deferred for a time.

If the heart rate is found to be moderately increased on examination, up to 100 or 110 beats per minute, and if after exercise this rate is not increased or is definitely lowered, one may conclude that the disturbance is of nervous origin and no real importance.

The quickening of the heart rate is usually of nervous origin, and as such must be taken into consideration with the other signs of nervous instability which may be found. Amongst candidates it is a very common condition, and as a medical examination has often a similar effect on seasoned warriors, too much stress must not be laid on this condition when it is nervous in origin and temporary. On the other hand, a slow pulse—namely, a rate of 60 to 70—is usually a good sign. Its presence at once excludes the numerous causes of disturbance or disease leading to a rapid cardiac action. It is also helpful in enabling one to judge more accurately as to the state of the circulation generally than when an excited and rapid heart action is present.

The Pulse.

Passing from the heart to the larger blood-vessels, we find valuable information supplied by the pulse. In a good type of candidate the pulse at the wrist is of good volume, of well-sustained tension between the beats, and does not show any sudden rise or fall during the beats. Elevation of the hand while the pulse is being felt may show a brief falling off in strength, but this soon passes off and the pulse quickly steadies itself whatever position the candidate assumes and whether the hand is lowered or raised.

In another type of candidate (C.V.D.) we find a pulse of a different kind. The volume may be good but the tension is badly sustained. The beat may be strong, may appear stronger than usual, but it is quick and snappy, and the tension falls abruptly. We seem to have a sudden filling and a sudden emptying of the vessel, which in well-marked cases is strongly suggestive of the collapsing pulse of Graves's disease or aortic regurgitation.

Suppose this condition is present when the candidate is lying on a couch with the arm at his side. If the arm is raised vertically so that the radial artery at the wrist is some 2 feet above the shoulder we find the above conditions are

intensified to a marked extent. If the tension of the pulse (horizontal) seemed rather poorly sustained there is no doubt about it when the arm is raised, and, further, there is no recovery of tension while the arm is raised. It is found useful to make this test by feeling both pulses (radial) at the same time, the candidate's one arm being raised and the other horizontal or pendant. One can then feel clearly the differences in the two pulses which has just been described.

In extreme cases of C.V.D. we often find that the pulse falls away so markedly with the arm elevated as to become almost imperceptible. The beat itself is so weak and feeble that one cannot make out a diminution in tension between the beats. Whatever the cardiac driving power may be, its force seems to have been largely dissipated before it reaches the wrist. The healthy type of candidate seems to have circulatory organs always "on duty," as it were, ready to respond to any change in the circulatory conditions, and able to maintain a steady circulation under altered conditions. The C.V.D. type, on the other hand, seems to have a circulation always "off duty," as it were, never ready to respond to a sudden change in the circulatory conditions, and unable to main a steady circulation under altered conditions.

Readings taken by the sphygmomanometer in a number of C.V.D. cases vary much, but they seem to show that the systolic pressure is normal or raised while the diastolic pressure is normal or lowered. In other words, the "pulse pressure" is usually above 50, and may be considerably increased.

The Peripheral Circulation.

As regards the peripheral circulation, we expect a good type of candidate to present signs of a healthy circulation in the hands and lobes of the ear. The colour should be light red or ruddy, and after pressure the superficial circulation should quickly restore the normal colour, while the extremities should be warm under the ordinary conditions of examination.

In a C.V.D. subject we find that the hands are dusky and cold, and that on pressure the pale patch fades away very slowly to be replaced by the same blue colour. When the limb is elevated above the head the force of gravity slowly removes the cyanotic hue from the extremity, which may become quite pale in colour. One is not surprised to find that chilblains are common in these subjects or that they suffer much from cold hands and feet.

A few candidates have shown or given a history of white and cold hands instead of blue. This points to a condition of vaso-motor spasm in the arterioles rather than relaxation. It is a more crippling condition as regards the use of the hands, and a history of "white fingers" or evidences of the condition should disqualify, as it would probably be intensified under flying conditions. We have met with some flying officers permanently disabled for air work by this condition.

Venous Plethora.

A tendency to venous plethora undoubtedly exists in these C.V.D. subjects, but is difficult to determine by physical signs at an examination. It is probable that the symptoms in these cases are elicited under exertion or excitement by overfilling of the abdominal veins, the so-called "splanchnic flooding" and fainting. The venous plethora in the abdomen is probably associated with the lack of tone in the abdominal muscles, to which reference will be made later. It may be shown in some cases, if the examiner presses both hands on the abdomen, by a swelling up and pulsation in the veins of the neck.

Conclusions Reached from the Physical Signs.

The above may be termed the physical signs by which we seek to determine the presence or absence of C.V.D. In themselves they do not indicate inability to perform the physical duties of ordinary life, nor do they imply ill health, although they may follow an illness. But the examiner's task is in a sense a prophetic one, and the question to be decided is as to whether a candidate showing the above condition of the heart and blood-vessels has a strong and stable cardio-vascular system, fitted for the duties of a flying officer. To this the answer is that he has not, so far as we can judge from civilian practice, from army experience, and from experience of flying officers who have broken down.

Practical Tests.

It must be admitted that practical tests as regards the efficiency of the cardio-vascular system leave much to be desired. A candidate labouring under the excitement of a medical examination is not in a condition to show his best or his usual form at testing exercises. Before he has been asked to do anything we may notice the quickened pulse-rate and the quickened breathing, of nervous origin. The tests which we should like to apply are not available in the limited accommodation of the examination room. The tests we do employ tend to be of an artificial character, and such as the candidate has not been accustomed to do, and such as he would often do after a little practice. Hence the late comers in the day may have had time to practise successfully the tests which the early comers have described to them!

One tests the effect on the heart rate and respiration of a definite amount of physical exertion such as that of swinging the raised arms down to the toes four times, or rising from the floor on one foot on to a chair and back again four times. The pulse-rate and respiration-rate are then counted, and the time taken until these rates return to normal (or to the candidate's rate at rest) is noted. A quick return to normal, say under 30 seconds, is regarded as a healthy sign, while a delay of over two minutes is suggestive of C.V.D. Perhaps more valuable than the heart rate is the quickened and even laboured breathing which follows this moderate exercise in many cases of C.V.D.

A greater amount of physical exertion may be employed by making the candidate march quickly up and down the room, or up and down a stair, and noting the effect on the pulse and respiration. No absolute standards can be given, but the examiner notes whether the result appears to be normal or excessive.

Another test employed has been that of breath-holding. The candidate, when seated, is directed to expire as deeply as possible, to inspire fully, and then to hold his breath as long as possible while the nose is clipped or closed with the fingers. A minimum of 45 seconds has been suggested as the pass standard. There is a scientific preciseness as well as plausibility about this test which has rendered it popular with some examiners. A failure to attain to the pass standard has been ascribed to an inability to obtain sufficient oxygen owing to a low "vital capacity," or to hypersensitivity, or to diminished oxygen pressure, or to the fact that the candidate uses up his available oxygen more rapidly than a normal man. There is evidently room for more scientific inquiry to determine what the test really does imply and mean, and its value as a test for aviation purposes. A high standard in breath-holding would seem to be more called for in sub-aqueous than in aerial pursuits.

A Difficulty in Exercise Tests.

One great difficulty in establishing any satisfactory exercise tests for the efficiency of the cardio-vascular system lies in this—that other systems are necessarily brought into action. If the exercise test is unsatisfactory the question arises as to how far the result was due to the cardio-vascular system and how far to some other system.

For instance, if after a brisk walk the candidate's pulse-rate remains unduly high, and his breathing is unduly laboured, we shall have to distinguish between the effects of exercise on (1) the cardio-vascular system, (2) the respiratory muscles, (3) the muscles involved in locomotion, (4) the pulmonary organs, and (5) the nervous controlling and coördinating centres. We have not been testing the cardio-vascular system alone, but have also of necessity brought in those other complicating factors.

When we come to discuss the method of summing up the results of the candidate's examination we shall find that this difficulty is often solved by the fact that, as a rule, evidences (symptoms and physical signs) of C.V.D. do not stand alone, but are accompanied by signs of debility in other tissues and organs. A very common cause of rejection is a combination of cardio-vascular and nervous debility.

THE NERVOUS SYSTEM.

Gross organic disease of the brain or spinal cord is not often met with amongst candidates. An old lesion like infantile paralysis, which may render a man unfit for general service, is no bar to flying work, provided that the functional efficiency of the affected limb or limbs meets the requirements of the flying service.

Disturbances of nervous function, either masked, as in the form of petit mal or asthma, or open in the form of over-excitability or instability, are very common amongst candidates. Any pre-existing nervous weakness is apt to be intensified by the conditions of a flying officer's life. The youth who stammered as a boy, but has been free from the habit for some years, resumes it when he has been in the flying service for a time. The youth who never stammered before, but whose father had a stammer, develops the condition under the stress of flying work. The subject of a previous nervous breakdown at school will probably have another similar attack after a slight crash. In this part of the examination the history of any previous nervous disability, personal or familial, plays an important part.

Points Considered in Examination of the Nervous System.

As the nervous system is exposed to considerable strain in the flying service, we wish to have some tests to determine the *nervous tone* and *staying power*. The task, however, is not easy owing to the absence of any recognised standards We have to recognise amongst the candidates a great variety of temperaments. We meet with the level-headed and calm, the keen and excitable, the somewhat dull and irresponsive, the youthful Hercules with sluggish mentality, and the absolutely stolid type. Each and all of these types may do good flying service in different departments of the work. Some of the excitable may become notable flying men; some of the phlegmatic may carry out routine duties for months without achieving anything brilliant, or, on the other hand, may become exceedingly good pilots.

The point to which we have directed attention in the selection is not whether a man is nervous and excitable, or dull and phlegmatic, but what *control* can he exercise. Before making a speech a public speaker may be intensely nervous, but, when he begins, calm and clear owing to the control which he has learned to maintain over himself. So in the case of nervous and excitable young men, the question is as to how much control they already possess, or are capable of developing, in view of the strain that lies ahead. It is impossible to pass a complete and final judgment on this question at one medical examination. Those who have been accepted and passed should also be carefully observed as to the above points at the flying schools by the C.O.'s and instructors, who see them at work under the actual conditions of service.

Another point which seems to have been brought out by experience is this, that the nervous type of individual, the man without much self-control, is apt to crack up readily under the stress of the minor accidents of training—e.g., a bad landing or a slight crash. There may be no physical injury, but the nervous control, such as it was, seems to be quickly and irretrievably lost. It is clear that a very large number of flying officers who have broken down never possessed a nervous system of even ordinary stability.

One must allow for the effects of excitement on the nervous system under a medical examination. This can usually be estimated at its proper value by putting the candidate at his ease. It may be considerably increased if the candidate has been kept waiting for some hours, or has been travelling all night, or is convalescing from acute illness. These points must be inquired into and taken into consideration.

Signs of Nervous Instability.

The condition of the deep reflexes is tested. As a rule they are fairly active in healthy candidates. An over-excitability and exaggeration of the knee-jerks and elbow-jerks has come to be regarded as an indication of nervous debility. When a brisk muscular response follows on tapping anywhere in the extremities there is positive evidence of an over-excitable nervous system. We do not find that these conditions stand alone, but that the candidate shows other signs of nervous instability. We have also found them present in flying men who have broken down in the service from nervous causes.

A persistent dilatation of the pupils with an excitable manner is regarded as suspicious of undue nervous excitability.

General tremulousness is not to be reckoned as a good sign, although it may be present merely as the result of excitement at the medical examination. A candidate is asked to hold out his hands and to close his eyes. The presence of tremor in the fingers and eyelids is looked for, and if this is constant and pronounced it is regarded as indicative of nervous instability.

Considerable emphasis is laid on the results of the balancing test, because healthy young men have no difficulty in balancing themselves steadily first on one foot and then on the other with the eyes closed and the hands at the sides. Many break down hopelessly from the start, and seem quite unable to maintain any stability on one foot. A man of this type will show other signs of nervous or neuro-muscular instability sufficient to cause his rejection. The pass standard requires that a candidate should be able to stand quietly and steadily on one foot for 15 seconds.

A candidate who sleeps soundly is usually healthy. On the other hand, a man who sleeps badly and who wakes unrefreshed and tired will usually have associated (as cause or effect) a weakened nervous system.

SUMMING-UP AND ASSESSING.

A certain number of candidates are eliminated because of some definite medical or surgical disease, or of their previous medical history, or of other clearly disqualifying condition.

Another group fall out, not from actual disease, but because the physique or cardio-vascular system or nervous system is so much below par as to show clearly that failure in the flying service would certainly follow.

Borderland Cases.

These two classes do not, as a rule, present much difficulty, but there is a third group of what may be termed borderland cases, in which the assessing of the candidate's fitness is no easy task. There may be no reasonable objection to his undertaking ground duties, but what we have to do is to form an estimate as to his stability or staying power for air work. Is the candidate suited for the special work during the training period and for the stress and strain of active service which will follow? As already stated, we are unwilling to base our decision on rigid single tests, first because it is easy to overestimate their importance, and, secondly, because we have not sufficient knowledge as to what they portend. The path of prognostic medicine is strewn with their discarded and dishonoured remains. In these borderland cases we lay most stress on the summing-up of the conditions found in connexion with the physique, the cardio-vascular system, and the nervous system.

The result of experience has been to show that if one of these systems is weak as a whole, functionally considered, there are several or many evidences to be found on testing. For example, if we find a weak flabby pulse we shall also usually find other evidences that a steady, strong, and effective circulation is not being maintained. If we find that a candidate is very unsteady and tremulous, we shall probably obtain other evidences of an unstable and imperfectly controlled nervous system. Further, as a matter of experience we find that when there are signs of cardio-vascular debility in a candidate the examination also reveals signs of nervous debility, and *vice versa*. It would appear that the two systems are often functionally weak in the same individual, so that in weighing the evidence we have to combine the results of the examination. A candidate may have certain signs of nervous weakness, not sufficiently pronounced to lead to his rejection, but when signs of a defective circulation are also present the combined weaknesses are sufficient to condemn him.

Not infrequently when the general physique of the cases which appear to be unsuitable from some systemic weakness is considered we shall find that it is definitely below the high standards and often distinctly poor.

Some Exceptions: Deferring Decision.

While the above experiences are common there are, naturally, exceptions met with. The candidate may have some weak points as regards the cardio-vascular system but be quite satisfactory as regards physique and nervous stability. He may be apparently weak in some points as to nervous control, but he may show a most satisfactory physique and cardio-vascular system. In such cases we should regard the weak points as being counterbalanced and compensated for by the strong ones, so far as the assessing is concerned.

"Be to his faults a little blind and to his virtues ever kind."

It is to be recognised that at the age we are dealing with the full development of the candidate has often not yet been

reached, and that while functional development in some parts of the body may be complete, it may be incomplete in others. It is also to be recognised that the effects of recent illness, of night travelling, or of the excitement of a medical examination, may cause temporary and local effects which must not be too much emphasised. For these reasons we do not reject candidates because of some evidences of defective functional powers, provided that they are counterbalanced by the presence of healthy functions generally, or can be explained by some temporary disturbance.

In some cases a final decision has to be deferred. A candidate suffering from active illness (for example, tonsillitis), or from recent acute illness, is not at his best, and if there is any doubt as to his suitability a final decision should be deferred until a further examination after his recovery. The case of the undeveloped boy presents some difficulty. He may be all right as far as he goes—but he has not gone far enough. It would be courting disaster to put him to work and strain for which he is not yet physically fitted. The examiner should state definitely about such a candidate that he is too undeveloped for flying work, and defer a final decision for 6 or 12 months. This period ought to be spent in physical training.

In the course of examination certain remedial defects or diseases may be discovered in otherwise eligible candidates which render them unsuited for air duties. In such cases the necessary treatment is to be ordered and the final decision deferred until a later examination, when the result of treatment can be estimated.

Suitability of Candidates for Various Kinds of Work.

It is not advisable to ear-mark the candidates who pass the medical examination for the special line of flying work they are fitted for. In the past we have made a distinction between those who were passed as pilots and those who were passed as observers. The latter were not quite up to the standard of the former, medically considered, and it was held that in the air the pilot had the more responsible post as, in addition to the control of his plane, his own life and that of the observer depended on his skill and judgment and self-control. On the other hand, if the observer broke down in the air the results would not probably be very serious. With the great intensification of aerial fighting that has taken place, and with the great nervous strain now imposed on both pilot and observer I am inclined to think that only first-class men should be passed as observers. Their individual responsibility may not be so great as in the case of pilots, but their duties call for physical and mental fitness of the highest order.

As regards the question of nervous strain there is no doubt that an observer, flying with a pilot he does not know or in whom he has lost confidence, may be much more strained, in a passive way, than the pilot whose mind is occupied with the immediate duties of flying his machine. He is so strained, in fact, in many cases that he is anxious to qualify as a pilot himself, in order to get relief at duties which he believes to be less onerous. Experience has confirmed this view, and many observers by becoming pilots—often very good ones—have probably been saved from a nervous breakdown. For these reasons, at the medical examination we are disposed to establish the same pass standard for pilots and for observers.

There are many types of work and many types of machine in the air force, but at the examination stage it is necessary to pass only first-class men. After qualifying they will be classified according to the type of work they show special aptitude for, and for which their physical powers and skill are best suited. Some will remain as home instructors, others will go in for scouting machines, bombing machines, low-flying machines, high-flying machines, &c. So far as their aptitudes, medically considered, are concerned, we think that there should not be an attempt at the examination to define them, or to impose any limitations as to the height at which a candidate should fly, or to specify the exact nature of his future work—e.g., artillery pilot, ferry pilot, &c. These matters can only be satisfactorily settled after the pilot has finished his regular course of training, when the commanding officer, the instructor, and the medical officer will have evidence before them of what actual experience has shown regarding each individual pilot. The examiner will do well to refrain from attempting to guess on limited knowledge what this actual experience will be.

TRENCH FEVER CACHEXIA.

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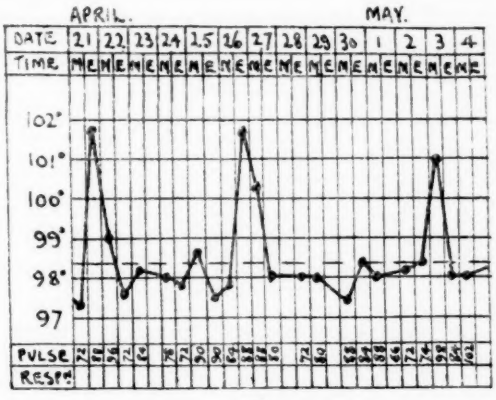
Trench fever has now become a "recognised disease" in the Army, and an enormous wastage of man power has been due to it.

Types of Trench Fever.

Major J. W. McNee, who early in the war did such good work on the condition, originally described two types of the disease—(1) the short type, and (2) the long one. The short type was characterised by a continued fever which lasted some eight days, then came down by crisis and was usually followed by a single short relapse, and then the disease was over. The long type, on the other hand, commenced with a short spell of fever, lasting perhaps four days, but this was followed some five to ten days later by a relapse of one or two days' duration, and such relapses usually recurred a number of times, and might do so for weeks or even months. Major McNee showed by inoculation experiments that these types were due to the same infection, in that volunteers inoculated with the blood of one type might sicken with either form of the fever. He stated that the long type of trench fever averaged four to six weeks, during which recurrences occurred at intervals, but he also said that "oscillation of temperature, with returns of pains and headache, may recur for weeks and (rarely) months." We now know this to be very true, as in hospitals in England we often come across such cases. Case 1 (Private M.) (see Chart 1) is an example of such, but they may recur for much longer than three months.



1

The Army Commission upon Trench Fever described three forms of the fever[1]: (*a*) Relapsing class, (*b*) single short bout and no relapse, (*c*) prolonged initial fever. Class (*a*) had two subclasses: (1) Regularly relapsing with normal intervals, and (2) irregular relapsing, in which the intervals between relapses are not so definite, or if the intervals are definite the temperature remains above normal. They state that the "irregular fever may last for several weeks," and one chart given in their report shows it still present on the sixtieth day, after which the patient was evacuated to England.

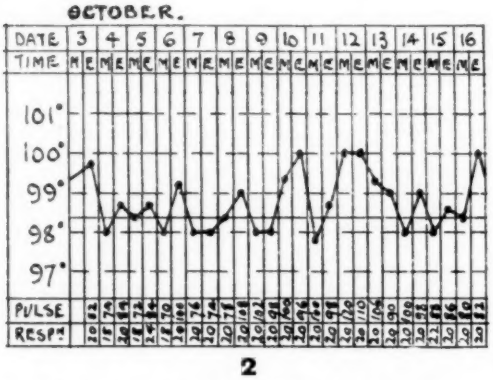
The American Red Cross Commission on Trench Fever, in their recent report, say that cases may last for 60 days or more, and the Hampstead Trench Fever Commission found the blood infective as late as the seventy-ninth day.

Cachectic Cases.

In one's work in the Canadian hospitals in England it is a very common thing to come across men who are debilitated and anæmic and suffer from pains, chiefly in the shins. If the temperature of these men be taken it is often found (although not in every case) to be running a little too high. If one looks at a *normal* temperature chart endways the

[1] Brit. Med. Jour., Jan. 19th, 1918, p. 91.

tracing tends to run below the 98·4° line; in other words, the normal temperature—so-called—is usually below the so-called normal temperature line marked on the charts. If, now, the temperature chart of a case such as we are describing be looked at in the same way, the average temperature will be seen to be set a degree or two higher than the normal, with occasional rises to 100° or perhaps 101°. A glance at the medical history sheets of these men will usually show that they were invalided from France as cases of P.U.O. or as trench fever, it may have been months or even over a year before.

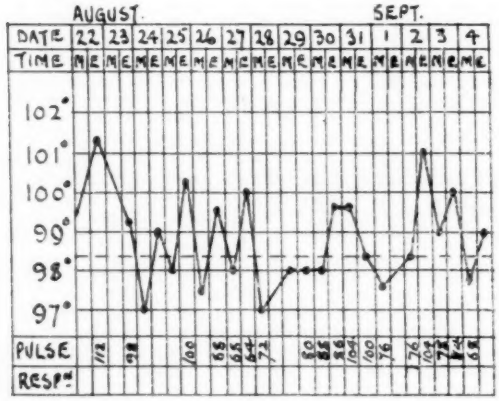


2

Cases 2, 3, 4, 5, and 6 are examples of this chronic fever, and they could be duplicated indefinitely:—

CASE 2.—Private S. (See Chart 2.) Took ill on July 28th, and was invalided as trench fever. Since then felt poorly, with aching shins. Temperature has remained on the average about 2° above normal ever since, with no definite recurrences. The last part of chart only is shown, but the whole chart is of the same type. He has had it for three months; no cause for the fever can be found.

CASE 3.—Private H. (See Chart 3.) Invalided from France with trench fever on May 23rd and had been suffering for some days before he "went sick." Since reaching England has been poorly, with headache and aching back and shins, worse at night. Nothing found to account for fever. Temperature has been running as in chart ever since admission here on August 10th—i.e., over four months. Last week's only shown.



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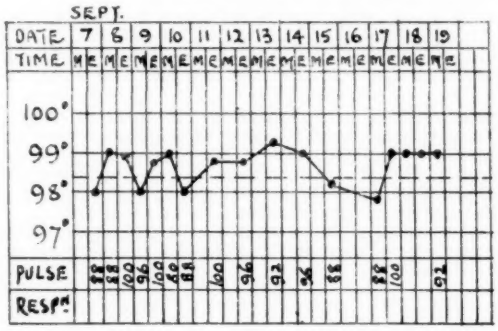
CASE 4.—Private M. (See Chart 4.) Invalided from France on April 19th last with trench fever; had been ill some time before. Ever since has been in same hospital and temperature running above normal at some time in the day, as shown in piece of chart reproduced. Still feeling poorly and has aching shins. Nothing found to account for condition.

CASE 5.—Private G. (See Chart 5.) Was invalided from France as trench fever, Oct. 17th, 1917, and had been ill for three weeks before that. Has been feeling out of sorts ever since, with sore shins that get easier on exercise. His medical history sheet shows that at various hospitals he had slight fever. Was treated for the fever in February and March with '606" (Wassermann was negative), but without benefit. Now, Sept. 30th, at a Canadian hospital, and chart of temperature for last week shows slight irregular fever. Nothing found to account for it. Thus he has been ill for at least a year, and is no better now than when he was invalided in October, 1917.

CASE 6.—Private E. Complains of pains in legs and small of back. Duration one year. History: Two weeks ill in France and invalided 29-10-17 as "trench fever." *Epsom*: Medical history sheet says 30-1-18. "On admission pain in legs below knee. No swelling. Urine negative. Remedial gymnastics; some improvement. Fit for discharge." No. 11, *C.G.H., Moore Barracks Hospital*: 27-6-18—15-7-18. M.H.S. "Headache, pains in body and shins. Temperature elevated. Recovery. Transferred to Cooden Hospital. Urine negative." Now has Major Carmalt Jones's areas of hyperæsthesia. Temperature, August 13th to Sept. 11th, was 97-99·2°.

Diagnosis.

In instances of slight rise of temperature, like those here shown, tuberculosis is naturally suspected, but in the great majority of the cases that I have carefully investigated in this respect there has been nothing to confirm the suspicion.



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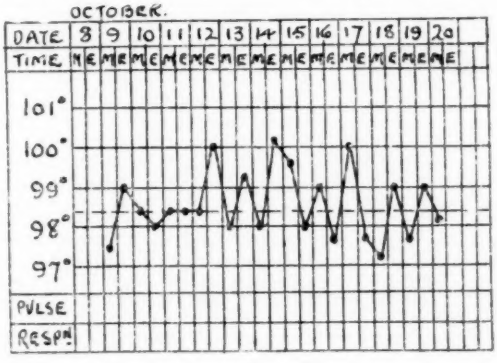
During some two years spent in base hospitals in France early in the war I saw many cases in which we were puzzled to account for just such slight chronic fevers, and, looking back on them now, it seems to me that they were examples of this trench fever cachexia, as one might well term it.

I mentioned above that the rise in temperature is not present in every case, because it is a common thing to see a man with the same appearance and same aching shins as the others who have no fever. Such cases may correspond to the afebrile type of malarial cachexia.

As regards the other symptoms of this chronic condition, one finds commonly that the spleen is enlarged, so that it is just palpable, and it is abnormally hard. I have observed no skin eruption. Blood examinations have shown nothing



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except a slight anæmia and occasionally a slightly raised leucocyte count. There is usually a relative rise in the lymphocytes, but according to D. L. Tate and J. W. McLeod, *M.C.*,[2] such a relative rise in lymphocytes is the rule in healthy soldiers.

I was much interested in a paper by Major D. W. Carmalt Jones[3] in which he shows that skin hyperæsthesia of a peculiar distribution is frequently present in trench fever, and as far as a few observations of my own (made since reading this paper) go this is so in most of these chronic cases. Thus, Private E., Case 6, showed hyperæsthesia exactly as described by Major Jones. These areas correspond to the eighth cervical, first and eighth dorsal, and all the

[2] THE LANCET, April 27th, 1918, p. 603.
[3] THE LANCET, Oct. 5th, 1918, p. 443.

lumbar segments of the cord. Major Jones states that this distribution of hyperæsthesia is found in malaria and trench fever, and in no other disease. If these findings are confirmed it may be of great help in the diagnosis of these chronic subjects of trench fever, who are apt sometimes to be considered as "lead swingers" or, at least, exaggerators, when they are really suffering from a definite and disabling condition.

The question of how long this chronic trench fever may last cannot yet be settled. The longest duration that I have yet noticed is a little over one year, but it is probable that it may go on for much longer than this. Patients are usually not very ill—only in low general health, with various pains—and so they are soon transferred to a convalescent camp, or put in low categories, where their slight fever is apt to be overlooked. Since I have asked at our convalescent hospitals that such cases have their temperatures taken regularly I have found a number who would otherwise probably have been missed. The resemblance of this condition to malarial cachexia is, in many ways, so great that I venture to suggest the name—trench fever cachexia—for it.

A NOTE ON THE VALUE OF GERMINATED BEANS IN THE TREATMENT OF SCURVY,

AND SOME POINTS IN PROPHYLAXIS.

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I.—*The Value of Germinated Beans in Treatment.*

IN describing the distribution among foodstuffs of the vitamines needed for the prevention of beri-beri and scurvy Dr. Harriette Chick and Miss E. Margaret Hume[1] have demonstrated by animal experiments that germinated pulses are richly endowed with antiscorbutic vitamine, and they make the following practical suggestion: "To prevent scurvy, if a supply of fresh fruit or vegetables is not procurable, germinated pulses should be added to the diet."

Many Serbian soldiers were treated for scurvy in this hospital in 1917, and when the disease became prevalent again this year an attempt was made to test the value of these germinated pulses in treatment. Unfortunately, no suitable seeds were forthcoming for some time. All the lentils supplied were decorticated and so would not germinate, peas could not be obtained, and beans, though expected daily, took over a month to arrive. In the meantime over three-quarters of the clinical material, including all the best cases, had been admitted and treated by other means. After beans were at last received comparatively few and slight cases became available for the test, but the results obtained were so good that they are worth recording.

Haricot beans were prepared according to the directions given in an appendix to the article quoted above. They were first soaked in clean water for 24 hours and then placed in tin trays for 48 hours to germinate. Old ration biscuit tins, cut in half longitudinally and freely perforated with holes, were found serviceable for this purpose; they were easy to make, clean, and handle, and each half held 7 pounds of beans—a day's dose for 28 patients. Since germination takes about 48 hours at a temperature of 60° F., it can easily be carried out in this country in May, when the mean temperature is 67°. The whole process is very simple, the only essentials being that the seeds must be kept moist, but not shut off from free circulation of air. After germination ten minutes boiling was ample to fit the beans for eating.

In addition to general use for many patients, two wards, each containing 27 beds, were specially devoted to the purpose of comparing the therapeutic values of these germinated beans and fresh lemon juice. Scurvy cases were admitted to these two wards alternately without selection. In one ward each patient was given 4 oz. of fresh lemon juice daily, the juice being expressed in the ward, sweetened slightly, and given as a measured dose by the sister. In the other ward each patient received a portion of germinated beans which had weighed 4 oz. in the dry state, half being taken at dinner and half at tea. In respect of other forms of treatment, such as tonics and local treatment to the mouth, no difference was made between the two wards.

A certain amount of prejudice against the beans had to be contended with. Though perfectly good to eat, it cannot be said that they always looked appetising, and some with a dark husk had a disagreeable sour taste. These disadvantages might have been masked by mixing the beans in a general stew, but it was thought better to serve them apart in order to ensure some accuracy of dosage and that the cooking should be limited to the shortest possible time. Apparently, however, the greatest difficulty was based on the fact that these beans are regarded as pig food by some Serbs, and this necessitated frequent explanation of their functions through an interpreter.

Since the cases were mild and presented but slight changes, it was not easy to make comparisons. In no case did fresh scorbutic signs appear after treatment was started, and in many local lesions were limited to the gums and the hair follicles. The degree of general cachexia present was not a safe criterion of the severity of the disease, because in many instances it was partly due to chronic malaria. Hair follicle changes are not a good guide to progress, since they always take many weeks to return to normal, however quickly the active tendency may be abolished. Alteration in the condition of the gums seemed to be the best index, although allowance had to be made for the presence of dental caries and previous pyorrhœa alveolaris.

In the special wards 30 patients were treated throughout with lemon juice, and 27 with beans. Contrasting them as regards severity of disease at the commencement of treatment, those treated with beans were, on the whole, slightly worse. The difference would be too small to mention, save that it justifies the definite statement that the bean cases were certainly as severe as the lemon cases. Comparing the results of treatment, there is a small but definite difference in favour of those treated with beans, 70·4 per cent. being cured within four weeks, as against 53·4 per cent. of those treated with lemon juice. These figures favour the bean cases unduly, the real difference being better expressed by the time taken for the gums to return to normal, which was 3·1 weeks for bean cases and 3·4 weeks for lemon cases.

In another series of 21 cases beans were not given until the patients had failed to make satisfactory progress after an average of four weeks' treatment in hospital by other means. These, although they had shown themselves rather refractory to ordinary treatment, all showed acceleration of progress when put on the beans, and in some the difference was very marked. For example:—

CASE 17.—Age 51. No previous scurvy. Patient had suffered from symptoms of scurvy, sore gums and pains in the legs, for three weeks before admission to hospital at X——. He was transferred to this hospital after 25 days' treatment at X——. On admission his gums still showed marked swelling and tendency to bleed, but there was no dental sepsis to delay healing. The hair follicles on the front of the legs and thighs showed a few fresh petechial hæmorrhages. There were no big muscle or joint hæmorrhages. General anæmia was marked. After 26 days' further treatment with 4 oz. of lemon juice daily, local treatment to the gums by hydrogen peroxide and tincture of iodine, and administration of an iron and arsenic tonic, so little improvement was seen that the treatment was changed by the simple substitution of the lemon juice by 4 oz. of germinated beans. In five days definite improvement was apparent, in 13 days the gums were noted as practically normal and in 20 days as quite normal.

These clinical results, then, confirm the experimental results of Dr. Chick and Miss Hume, and permit the definite conclusion that dry beans develop, upon germination, an amount of antiscorbutic vitamine at least equal to, if not greater than, that contained in fresh lemon juice.

II.—*Deductions from Consideration of the Rations upon which our Patients became Scorbutic.*

(*a*) *Meat.*—Of 132 cases of scurvy whose previous diet was investigated last year all had received a ration of frozen fresh meat practically every day; and of 175 investigated this year very few had received it less than three times a week. Fresh raw meat is known to contain a small amount of antiscorbutic vitamine. To what extent freezing and subsequent cooking are respectively responsible for the destruction of this vitamine remains uncertain, but it is obvious that between them they render meat practically useless as

[1] Harriette Chick and E. Margaret Hume: The Distribution Among Foodstuffs (especially those Suitable for the Rationing of Armies) of the Substances Required for the Prevention of (*a*) Beri-beri, and (*b*) Scurvy, Journal of the R.A.M.C., xxix., No. 2, August, 1917, p. 121.

an antiscorbutic. In the case of tinned meat the vitamine seems to be completely destroyed by the temperature needed in the process of tinning, so that for practical purposes the meat-supply of troops in the field must be regarded as totally devoid of antiscorbutic properties.

(*b*) *Lime juice.*—In the past lime juice had a well-deserved reputatien as an antiscorbutic. The vast majority of the patients admitted to this hospital had never received a single dose. Three, however, were exceptions, having developed scurvy after taking a small quantity every day for a month. These become significant in conjunction with the fact that Dr. Chick and Miss Hume found by experiment that modern preserved lime juice has but feeble antiscorbutic power, and suggest that it would be unwise to place too much reliance upon modern supplies for prophylaxis. Probably, as suggested by Dr. Chick and Miss Hume, the lime vitamines are destroyed by modern methods of manufacture.[2]

(*c*) *Fresh fruit.*—According to their own statements, not one of the patients seen this year or last year had received any fresh fruit previous to admission to hospital. Oranges and lemons become available in the early spring, but even when a sufficient quantity can be obtained they are difficult to store and transport, owing to their bulk and perishable nature. This difficulty seems to have prevented them from reaching the troops at the front last year, and would operate in the same way in future. Further, these fruits cannot be obtained in sufficient quantity in the early months of the winter, the time when they are most needed to combat the early stages of vitamine deficiency.

(*d*) *Vegetables.*—In the last two winters the vitamines received by scurvy patients before admission to hospital had been limited to those contained in potatoes and onions, with the addition, late in the season, of spinach. The potatoes, when issued, were always greatly diluted with rice, so that the amount received by each man was very small. This year out of 175 patients 101 stated that their weekly allowance of vegetables had been one, or at most two, issues of potatoes with rice, and one issue of onions. Most of these were admitted early in the season. Fifty-eight men, most of whom were admitted rather later, had fared better, receiving potatoes with rice twice a week, onions once or twice a week, and spinach once or twice a week. This should be a fairly generous supply of vitamine, and is unlikely to be exceeded next winter, but the fact remains that these men became scorbutic.

Sixteen patients were of special interest, because their diet for a month before admission should have contained sufficient vitamine not merely to prevent scurvy but actually to cure it. Eleven of these had received "plenty" of onions daily, most of them having also had potatoes with rice twice a week and spinach twice a week. Two, in addition to the above, had also received a small dose of lime juice every day, and the remaining three had received spinach every day. Now, onions, potatoes, and presumably spinach are very rich in antiscorbutic vitamine in the raw state. Granted that these men may have reached a serious stage of vitamine deficiency before their diet became so generous, the fact that they did develop scurvy on the above diets is difficult to explain except on the assumption that nearly all the antiscorbutic vitamine of the vegetables must have been destroyed in the process of cooking. This point is referred to later.

III.—*Conclusions Regarding Preventive Measures for the Coming Winter.*

(*a*) *Preventive measures should be commenced not later than the end of November and should be continued through the whole winter.*—It is essential to remember that the occurrence of the first case of scurvy in an army does not mark the beginning of vitamine deficiency. There is a prescorbutic stage, comparable to the incubation period of infective disease, during which, although the troops may appear to be in excellent health, they are in reality far from physically fit. In the case of troops rationed as the Serbian front line regiments were during the last two winters the duration of this stage probably varies between two and four months. Apart from the possible occurrence of clinical scurvy later on, so long as an army is in this prescorbutic stage of vitamine deficiency it is in danger of breaking down from various causes, such as extra physical stress, exposure to severe weather, or the presence of epidemic infections. In other words, an army deficient in vitamine is an army of deficient vitality, although until recognisable scurvy actually breaks out there is nothing to demonstrate the fact and serve as a warning.

During the last two spring seasons scurvy was sufficiently prevalent amongst Serbian troops to show that the Serbian Army, as a whole, was suffering from this vitamine deficiency to a serious extent. Clinical scurvy appeared in November, and continued until May. Vitamine deficiency must have commenced in November and continued until May, so that in any army placed under similar conditions in the future preventive measures should begin not later than the end of November, and be continued throughout the winter.

(*b*) *The destruction of antiscorbutic vitamine which takes place in cooking must be avoided as far as possible.*—The exact mechanism of this destruction is not known, but it is generally allowed that vegetables lose antiscorbutic power when cooked, and some of our patients mentioned above afford clinical proof of the fact. Simple heat and altered chemical reaction are both under suspicion as the destructive agents. Dr. Chick and Miss Hume quote an experiment which shows that cabbage leaves lose half their antiscorbutic power when boiled for half an hour, but more experimental data dealing with this point are needed.

Recently Harden and Zilva[3] have shown that the antiscorbutic principle of orange juice is rapidly and permanently destroyed when the juice is made N/20, or N/50, alkaline with caustic soda, and they suggest that any cooking entailing alkalinity will injure the antiscorbutic potency of the substance cooked. Army cooking of vegetables does not entail alkalinity. Some salt is always added to the water in which vegetables are boiled, and this may be either "issue" salt or salt in which bacon has been packed. In distilled water both of these give a solution which is neutral to litmus and is certainly not alkaline to phenolphthalein. A raw potato is acid to litmus and it remains acid when fully cooked. The water in which potatoes have been cooked remains neutral. Onions are acid when raw, and not only remain acid when fully cooked, but impart a definitely acid reaction to the water in which they have been boiled. The same is true of germinated beans. These also not only remain acid when cooked, but impart some acidity to the water in which they have been boiled. In consequence, the question of alkalinity produced by cooking does not exist as far as Army methods are concerned, and in the present state of our knowledge it will be safe to regard heat as the destructive agent and to reduce the heating of all vegetables to the absolute minimum required to make them digestible.

The reduction of raw potatoes to the condition of a digestible cream would be too difficult to carry out on a large scale without the provision of some special apparatus of the type of a "Hercules press"; but small quantities of onion and spinach would be sufficiently digestible if chopped or minced into fine particles. If thoroughly mixed with a stew at the completion of cooking these vegetables should be well taken in the raw state, and would add very greatly to the antiscorbutic value of the diet.

(*c*) *The addition of some fresh vitamine-containing substance being needed germinated pulses, as suggested by Dr. Chick and Miss Hume, would provide the easiest and cheapest method of effecting this addition.*—As shown above, modern lime juice is not to be trusted as an antiscorbutic, and fresh fruit and vegetables (in the quantities available) have failed to prevent scurvy for two years in succession, but germinated haricot beans, even when fully cooked, contain at least as much vitamine as fresh raw lemon juice. Other pulses which might be germinated and would probably give as good a result are peas, beans of any variety, and unmilled lentils. It only remains to show that it would be practicable to provide these for troops in the field.

In this country germinated pulses would only be required during the winter, a season which has the disadvantage of necessitating the provision of some artificial heat to ensure germination. This disadvantage is counterbalanced by the fact that the movement of troops is lessened during the winter months.

The advantages of these dry seeds over all other forms of fruit and vegetables, both for storage and transport, are obvious. Since they double in weight and bulk and require to be kept moist when germinated, this process should be carried out as near the site of consumption as possible. In stationary trench warfare it should not be necessary to attempt germination in the actual front line, because the supply of vitamine by this method is so generous that it would suffice for preventive purposes if given every other week, or every other fortnight, when the troops were in rest.

[2] THE LANCET, 1918, ii., 735.

[3] A. Harden and S. S. Zilva: A Note on the Susceptibility of the Antiscorbutic Principle to Alkalinity, THE LANCET, Sept. 7th, 1918, p. 320.

Should, however, a battalion be compelled to stay in the front line for longer than a fortnight it would not be difficult to supply it with pulses already germinated, since at most two hundredweight (100 kg.) per day would be needed for a thousand men, and this weight represents so much food transported as well as so much vitamine.

In the case of a war of movement local conditions and temporary needs and opportunities would have to be considered as they occurred, again always keeping in mind the fact that the supply need not be continuous for preventive purposes, and that these pulses provide their full value of food as well as their supply of prophylactic vitamine.

As regards germination, the preliminary soaking for 24 hours can be done anywhere. For germination itself the essentials are moisture and protection against cold, but without the exclusion of air. The rate of germination varies with the temperature and the type of pulse. Seeds were not obtained here until too late to test them in cold weather, but, judging by the season at which peas and beans are sown in England, no cold short of definite freezing would arrest the process completely, though it would, of course, lengthen the time required for growth to take place. Hence, if facilities are lacking for keeping a supply in process of germination, the time taken must be shortened by the provision of artificial warmth.

The space required and needing to be kept warm is very small. Allowing 2 oz. per man per day, a dose which should be ample for prophylaxis, a day's supply for 1000 men could easily be accommodated in a space of 30 cubic feet. On an average of three days for soaking and germination this means that a space of 100 cubic feet would suffice to provide a continuous supply for 1000 men.

In Salonika during the three cold months, December (mean temperature 46° F.), January (mean temperature 42° F.), and February (mean temperature 45° F.), artificial warmth would be essential. For this a building or tent would be a great advantage, but failing these the necessary warmth might still be obtained by means of a hotbed anywhere within reach of fresh horse or mule manure. During November (mean temperature 52° F.) and March (mean temperature 50° F.) germination could be carried out in the open without artificial warmth, provided that some protection were given at night and during spells of bad weather. A few boxes and some old sacking would provide all the protection needed.

The beans soften so much in the process of germination that ten minutes' boiling is ample to cook them fully. If crushed or pounded they can be eaten raw, but this should rarely be necessary unless the supply ran short.

Allowing for the fact that beans are food and lemons are not, the vitamines supplied by the former are really obtained almost free of cost. Even if no allowance is made for the food value of the beans, the cost of the vitamines supplied by them would still be only 60 per cent. of the cost when supplied by lemons.

General Conclusion.

The statement of Dr. Chick and Miss Hume that germinated pulses are richly endowed with antiscorbutic vitamines is amply confirmed by the fact that germinated beans were found quite as potent as raw lemon juice in the treatment of scurvy. Their suggestion that germinated pulses should be used for the prevention of scurvy is capable of practical application, and would be the easiest and cheapest method by which to prevent the occurrence of scurvy in an army in the field.

In the case of vegetables cooked in the Army manner the destruction of vitamine which takes place cannot be ascribed to the production of alkalinity.

In conclusion, my thanks are due to Lieutenant-Colonel A. R. Greenwood, R.A.M.C., for permission to publish these cases; to Miss M. J. Ahern for careful clinical notes; and also to Quartermaster-Sergeant Andrews, R.A.M.C., for constant supervision of the germination and cooking of the beans.

DEATH OF HENRY ALBERT PATTINSON, M.R.C.S. Eng., L.R.C.P. Irel.—Mr. H. A. Pattinson died recently at Seafield House, Seaton, Devon, in his 79th year. He had practised in Seaton for more than 50 years, and had been medical officer of health for the town since the formation of the Seaton Urban Council in 1892. Expert at all games, he was prominent in founding the Seaton Cricket and Lawn Tennis Clubs and the Axe Cliff Golf Club, of which he was honorary secretary for many years.

BEER AND SCURVY.

SOME NOTES FROM HISTORY.

BY ALICE HENDERSON SMITH.

(*From the Lister Institute of Preventive Medicine.*)

Captain Hamilton Dyke's account in THE LANCET of Oct. 19th of an outbreak of scurvy in the South African Native Labour Corps, and his demonstration of the useful place taken by kaffir beer in the diet of these natives in their homes, are very interesting in view of the use of small beer of various kinds in the Navy and other ships, and the belief that long obtained in its antiscorbutic power. During a search in the Admiralty records for information on another subject some points have come up in this connexion that it may be worth while to record briefly.

Long History of Use of Spruce-beer against Scurvy.

Beer was held for generations to have considerable value as an antiscorbutic, and was long used as such on sea-voyages. The virtue of it was not attributed solely to the various ingredients from which it was brewed but largely to the fermentation itself, and beers were made of different materials and in different ways. The early spruce-beer, which was indebted for its potency, at least in some methods of preparing it, to the fresh leaves from which it was named, has a long history. It was used by explorers at least from the time of Willem Barentz[1] and probably before that. Barentz carried on his voyages in 1594–97 casks of the "*jopen-bier*" or "*sprossen-bier*" that was then made round the Baltic with the green leaf buds or *sprossen* of the fir-tree in it, the original spruce-beer. The *sprossen* used were generally those of the spruce (*Pruce* or *Prussian*) fir (*Abies excelsa*). In this beer the green buds seem sometimes to have been added to the fermented malt, as hops are added now. Alternatively the fir was boiled in water and the infusion fermented, and since a mere infusion of spruce-tips or the fresh spruce-tips eaten as a salad have proved useful, it is probable that the original spruce-beer was of some value. Dr. Lind says[2] (in 1757):—

"A simple decoction of the tops, cones, or even bark and wood of these trees is antiscorbutic, but it becomes much more so when fermented, as in making spruce-beer. Spruce should be carried to sea; if not, the common fir-tops used for fuel should be first boiled in water and the decoction afterwards fermented with mollasses, in the common method of making spruce-beer."

He himself prescribed at Haslar, with beneficial results, a daily pint of "strong beer medicated with the most powerful antiscorbutic herbs." It was long the custom on distant voyages always to make spruce-beer on touching land, if it were possible.

But the name spruce-beer came to be applied often to beers that were entirely innocent of the fresh *sprossen*, as in the modern Dantzic spruce, whether or not the spruce flavour was introduced. The essential element, of course, from the point of view of scurvy, was the freshness of the vegetable ingredient, and, as has happened in the history of other antiscorbutics, the belief in the value of the drink persisted after the elimination of the element on which that value depended. We find later an Arctic officer stating that spruce-beer was brewed on board his ship when she was in the ice several degrees of latitude beyond the highest at which the fir grows. This beer was sugar or malt beer, flavoured with "essence of spruce."

Value of Sweetwort.

The value of fresh germinated barley has been shown anew recently by Fürst,[3] and the actual experience of its use seems to suggest that malt which is not "highly dried," as in the modern manner, probably retains much of its potency. Even in a simple brewing process the beer may

* Companion papers entitled (1) The Relative Content of Antiscorbutic Principle in Limes and Lemons together with Some New Facts and Some Old Observations Concerning the Value of "Lime Juice" in the Prevention of Scurvy, (A) *Experimental Inquiry*, by Harriette Chick, E. Margaret Hume, and Ruth F. Skelton, (B) *Historical Inquiry*, by Alice Henderson Smith, and (2) An Investigation of the Antiscorbutic Value of the Raw Juices of Root Vegetables, with a View to their Adoption as an Adjunct to the Dietary of Infants, by Harriette Chick and Mabel Rhodes, appeared in THE LANCET of Nov. 30th, 1918 (p. 735), and Dec. 7th, 1918 (p. 774), respectively.

[1] "Journal of the Three Voyages of Willem Barentz," Gerrit de Veer, published by the Hakluyt Society, 1876.

[2] A Treatise on the Scurvy, Lind. 2nd edit., 1757.

[3] Fürst: Zeitschrift f. Hygiene, 1912, vol. lxxii.

still keep some of the barley's virtue, apart from any that the fermentation or added ingredients may give it. Captain Dyke shows that this is the case with the germinated millet of the Kaffirs, and malt beer and an infusion of malt called "sweetwort" were used, with a profound belief and a good deal of evidence in their favour.

Sweetwort was proposed for use in the Navy by Dr. David McBryde in 1762. It was an infusion prepared by pouring boiling water over malt and allowing it to stand for three or four hours, after which it must be used at once. It is, so far, similar to the kaffir beer, but the sweetwort was not fermented; and, of course, the African drink has this advantage, that the grain is germinated as it is required and used absolutely fresh, whereas the sweetwort was made from malt carried to sea. Preliminary trials of Dr. McBryde's receipt at the Royal Hospital, Plymouth, were unfortunate owing to his demanding for its best demonstration the exclusion of all fresh meat and vegetables from the patient's diet. Naturally it was with great reluctance that the patients submitted, and when a man died of scurvy under the treatment the experiment was stopped. It was then suggested by the Sick and Wounded Board of the Admiralty for use on board ship, where fresh food was not available, and it was ordered to be carried to sea, but the peace of 1763 put an end to opportunities for testing it. It was as an experiment still, in 1770, that "barrels of well-dried malt" were ordered to be put on board two of H.M. ships for trial in scurvy cases, and in the following year an "inspissated juice of malt" was tried. Captain Cook seems to have had both of these when he sailed in 1772. In this classical example of a long voyage without serious loss from scurvy in days when great suffering and loss from the disease were the rule, sweetwort was the prophylactic to which he attributed much of the credit of the immunity. After his ship, the *Resolution*, had been at sea continuously from Nov. 22nd, 1772, until March 26th, 1773, we read [4]:—

"After such a long continuance at sea in a high southern latitude, it is but reasonable to think that many of the people must be ill of the scurvy. The contrary, however, happened. Sweetwort had been given to such as were scorbutic. This had so far the desired effect, that they had only one man on board that could be called very ill of this disease, occasioned chiefly by a bad habit of body and a complication of other disorders."

And this sweetwort is described [4] as "one of the best antiscorbutic sea-medicines then discovered when used in time." Other antiscorbutics that Captain Cook had with him were saurkraut and a "rob" or essence of lemons and oranges. He also brewed malt or spruce-beer whenever opportunity offered.

Another explicit statement of the value of the sweetwort occurs in a letter [5] from Admiral Graves to the Victualling Board of the Admiralty in 1794, in which he says:—

"On the American voyage of the *London* essence of wort [the same malt infusion apparently, from the context] had been given, with such vegetable acids as the surgeon had. Scurvy gradually gave way, and they sent only four to hospital instead of thirty or forty, as other ships did at New York."

It was among several antiscorbutics in constant requisition in the Navy, until they were abolished on the introduction of lemon juice.

Further Experience of Malt Liquor as an Antiscorbutic.

Dr. James Lind [6] says that beer, wine, and other fermented liquors are all antiscorbutic. Sir Gilbert Blane [7] held the same opinion, and, when speaking of the "extremely wholesome and antiscorbutic" nature of malt liquor, he says:—

"The common quantity of small beer allowed (in the Navy) is so liberal that few men make use of their whole allowance; and there is no objection to the constant use of it except that it is apt to spoil in the course of a few weeks, and that upon foreign stations the stock can seldom be renewed. One of the greatest improvements that could be made in the victualling of the Navy would be the introduction of porter, which can be preserved in any climate for any length of time that may be necessary."

As a matter of fact, porter was sometimes refused, when asked for for the sick, on the ground of expense, wine being given instead. He goes on:—

"I was furnished by Dr. Clephane, physician to the Fleet at New York, with the following fact. In the beginning of the war two storeships called *Tortoise* and *Grampus* sailed for America under convoy of *Daedalus*, frigate. *Grampus* happened to be supplied with sufficient quantities of porter to serve the whole passage, which proved very long. The other two ships were furnished with the common allowance of spirits. The weather being unfavourable the passage drew out to fourteen weeks, and upon their arrival at New York the *Daedalus* sent to hospital a hundred and twelve men, the *Tortoise* sixty-two, the greater part of whom were in the last stage of the scurvy. The *Grampus* sent only thirteen, none of whom had the scurvy."

Sir Gilbert believed, also, in the virtue of spruce-beer, and says that as the fir "seems to be more medicinal and antiscorbutic than hops, it is therefore perhaps preferable to malt liquor." Beer was issued in the Navy in his time at the rate of a gallon per head per day so long as the supply taken out lasted; but this was never for more than about a fortnight, after which grog or wine was given, the allowance of wine being a pint a day. For foreign service beer was not supplied at all.

When the war with Spain, in 1796, sent up the price of lemon juice by cutting off a source of supplies, the Sick and Wounded Board wrote to the Lords Commissioners that "though they do not consider strong beer a substitute for lime juice and sugar for scurvy, yet as it is conducive, they recommend" that the experiment be made of substituting it on some ships.

Beer, then, had a solid reputation as an antiscorbutic, although by the beginning of last century the first place was, of course, given to lemon juice. When the end of the long wars permitted the renewal of the search for the North-West passage in 1818, malt and yeast were taken on the exploring ships and small beer was brewed on board. Sir Edward Parry himself attributed great importance to it, and other explorers of his time concur in this opinion. Malt was carried, too, by the whaling vessels, whose business took them farther into the North than any others except the explorers, and who were, like them, liable to be detained in the ice for long periods. When Sir John Franklin went out in 1845, and was followed later by many ships sent out to seek him, a brewing apparatus was carried and beer was brewed on board these ships. But they also carried Allsopp's pale ale in casks and used it while it lasted, generally through the first winter. The belief in beer was firmly established, and it was always issued at once to men on the sick-list on these expeditions. It was also issued on some ships as an extra safeguard against scurvy for some time before sledging parties went out; and by Sir Leopold McClintock it was actually issued at times as an alternative to lemon juice.

Elimination of Antiscorbutic Element.

But by the time the Franklin Search ships went out the malt used was "high-dried, kilned malt."[8] Again the essential element is removed without its importance being observed, and the traditional belief now pertains to a beer from which the antiscorbutic value of the germinated malt has been removed unwittingly by the improvement of the malting processes. This alters the whole question and throws on to other elements in the drink any dietetic value it may have possessed. Moreover, in view of the unstable nature of the protective element it is probable that, whatever the malt used, any antiscorbutic value that beer may have must be greater in a freshly brewed beer, consumed immediately, than in ales made for export and kept for many months before they are used. The tradition was strong, however, and the officers of the Franklin Search ships believed in their beer; many of them speak of it as a wholesome and suitable beverage for Arctic service, and attribute to it something of the good health and freedom from scurvy of their men. In so far as it was substituted for rum, it could be only good, but when tested as an antiscorbutic it fails. The British ships were at this time fortified effectively against scurvy with lemon juice, but the American ships of the Grinnell Expeditions [9] that took part in the search for Franklin did not use lemon juice; they relied principally upon raw potatoes and molasses, but beer brewed on board ship was reckoned a considerable part of their defence. The first Grinnell ships left the States in May, 1850, and scurvy began to show on board of them so early as September. There is surely little practical antiscurvy value in a regimen that permits the onset of scurvy in so short a time, and that notwithstanding the fact that the ships had a certain amount of fresh meat in summer. Dr. Kane, who was medical officer of the first Grinnell Expedition, was commander of the second, and went out

[4] Voyages of Discovery by Captain Cook.
[5] Pub. Rec. Off., Admiralty Sec.'s Letters—Digests.
[6] Lind 1757): L.c. [7] Diseases of Seamen, 1785.

[8] Messrs. Samuel Allsopp and Sons have kindly given me explicit data about the beer supplied by them to these ships.
[9] "U.S. Grinnell Expedition in Search of Sir John Franklin," Dr. Elias Kent Kane, 1851; Arctic Exploration: the Second Grinnell Expedition, Dr. Elias Kent Kane, 1856.

again in 1853. In his long wrestling with scurvy he spent his resources, apparently out of all proportion to the results, to produce any sort of fermented drink for his men; and his laborious achievement of a sort of beer when there were only three men, himself included, of the ship's company able to move from their bunks, argues a great faith in its value. But there is nothing to show that it justified his faith. All his ingenuity may possibly have delayed the onset and progress of the disease, but his men were in the last stages of scurvy and it was only their occasional supplies of fresh meat that saved them.

At its best, under the most favourable conditions, it has never been claimed that beer is a complete protection from scurvy over any extended period of time; and even in Cook's time his beer and his infusion of malt did not alone confer invulnerability. But (before lemon juice removed the need of it) malt preparations do seem to have given a very considerable measure of protection when methods of malting and brewing were simple. Later, as a nourishing drink, and as a substitute for spirits, beer still had value for the seaman on Arctic service; but with the elaborating and perfecting of malting and brewing processes, the antiscorbutic element seems to have been largely if not completely eliminated. Thus the conclusion drawn by Harden and Zilva[10] from their recent experiments with beer made from kilned malt is confirmed by the history of its failure in Arctic experience. But Captain Dyke's account confirms and justifies the belief in the beer used by earlier generations in the Navy, a hundred and twenty years ago.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

PRE-OPERATIVE X RAY DEMONSTRATION OF SILENT INTRATHORACIC METASTASES OF MALIGNANT DISEASE.

BY C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P.

THERE are probably few surgeons who, after having removed a malignant growth with its lymphatic area, have not experienced the disappointment of seeing the patient rapidly die from intrathoracic metastases, while the operation area remained free from recurrence. In not a few of these cases the symptoms of intrathoracic involvement appear so soon that there can be no reasonable doubt that the secondary growths were actually present at the time of the operation. Secondary deposits within the thorax are often "silent"—i.e., may exist for a long time and reach a considerable size before giving a distinctive clinical picture. Radiography is in many cases able to demonstrate the existence of these metastases while still silent. Of this the following case is an example.

A stout multipara, aged 60 years, was seen by the writer last spring. The right breast contained a cancerous mass, the size of a lawn-tennis ball, which had invaded the skin surrounding the nipple, but had not yet ulcerated. The breast was freely movable on the chest wall. No glandular involvement could be felt. Clinically the thoracic contents appeared normal. Except for a somewhat feeble pulse there was no obvious reason why a radical operation should not give a chance of cure, provided that radiography showed no intrathoracic metastasis. The skiagram, however, showed, in both sides of the chest, masses of growth, which appeared as shadows, 5 inches in vertical extent, to the right and left of the sternum and pericardium. The husband was informed of the impossibility of a cure by operation, but was advised to sanction a simple removal of the breast in order to prevent the sepsis which would occur as soon as the involved skin gave way.

The breast was removed, and 14 days later the patient left the nursing home. The pathologist reported that the growth was an alveolar carcinoma with very little connective tissue. Three weeks after operation a slight cough developed, but subsided under treatment. Six weeks after operation dyspnœa commenced and the cough returned, with crepitations in both lungs, death occurring three months after removal of the breast.

In nearly every form of malignant disease the thoracic contents are a possible site of metastases which for a time may cause no symptoms. The presence or absence of such metastases cannot be decided by a consideration of either the size, duration, or position of the primary growth. Further, the metastases frequently cannot be detected by ordinary clinical methods.

Radiologists are now usually able to demonstrate the presence of secondary malignant deposits within the chest. There is no reason why the radiographic examinations should not include regions other than the thorax in which deep-seated silent metastases are prone to occur.

The principle of employing routine pre-operative radiography in those varieties of malignant disease, both sarcoma and carcinoma, which are liable to cause intrathoracic metastases is relatively new, and at present is but little acted upon. Its importance for the prevention of useless operations is obvious. The principle is deserving of wide recognition and application.

The results of its adoption in the surgery of malignant disease may be expected to include: 1. A diminution in the number of radical operations performed on cases in which the disease has, prior to operation, produced inoperable metastases, and this elimination of incurable cases will, as time goes on, result in a higher percentage of cures among the cases on which radical operations are performed. 2. A decrease in the number of palliative operations, because many patients decline any form of operation unless the surgeon is able to hold out a definite possibility that the operation may result in cure.

Plymouth.

[10] Harden and Zilva, 1918. Journal of the Institute of Brewing.

TOTAL EXCISION OF THE URINARY BLADDER.

BY JOHN C. JEFFERSON, F.R.C.S. ENG.,
HONORARY SURGEON, ROCHDALE INFIRMARY.

THE following record gives an account of a case of total excision of the urinary bladder in a woman for advanced epithelioma of the urethra.

A married woman, aged 60, admitted to Rochdale Infirmary, stated that three months before she had noticed pain on micturition and difficulty in emptying the bladder, these symptoms gradually becoming worse. About two weeks before admission incontinence took the place of retention. An advanced epithelioma of the urethra was found. I am of the opinion that it originated within the urethra, as the greater part was inside the urethral orifice and not actually about it. Further, though the growth had invaded the sphincter vesicæ, causing incontinence, it had not become attached to the pubic rami. The inguinal glands on the left side were enlarged, but freely movable. The patient was in good condition. Some urine obtained by taking catheter specimens was not foul, though it contained pus, and it improved considerably under treatment. As the patient was in a very miserable condition owing to the constant dribbling away of the urine, I decided to transplant the ureters with their vesical orifices into the colon, to remove the bladder and urethra completely, and at a subsequent operation to remove the inguinal glands.

On March 4th, 1918, with patient in high Trendelenburg position, I opened the abdomen in the middle line, the incision extending from pubis to umbilicus. The intestines were thoroughly packed off with gauze and the wound edges protected with tetras. A transverse incision was made through the vesico-uterine fold of peritoneum and the bladder separated from the cervix uteri and vagina. The ureters were readily distinguished and isolated for not more than ½ inch from their entry into the bladder, a stout loop of silk passed beneath each facilitating handling. The peritoneum on the superior aspect of the bladder was peeled off and the viscus freed on all sides until the pelvic floor was reached. The bladder was opened and the ureteric orifices, with a small circle of mucous membrane around each, excised.

The pelvic colon, which, fortunately, had a long mesentery, was next brought down and each ureter transplanted into it separately, as follows. A linen thread stay suture was passed through the mucous membrane around the ureteric orifice. A small incision was next made into the lumen of the colon through the anterior muscular band. Both free ends of the thread were now passed through the eye of a long curved intestinal needle, the needle passed into the lumen of the bowel through the incision and out again through its walls about 1 inch from the point of entry. By drawing on the thread the ureter was then pulled well inside the bowel and retained there while the aperture was closed around it and the terminal free part of the ureter enfolded in the bowel wall with Lembert sutures. The stay suture was then cut and removed. By this means the

ureter was drawn through a considerably smaller aperture in the bowel than otherwise would have been possible, and one was enabled to work with a shorter length of isolated ureter.

The transverse incision through the peritoneum of the utero-vesical fold was now sutured around the portion of pelvic colon which had been brought down and the abdomen closed without drainage. The patient was placed in the lithotomy position and the removal of the bladder, together with the urethra and the lower part of the anterior wall of the vagina, rapidly completed. A large drainage-tube was inserted into the space left.

The patient bore the operation remarkably well and, with the exception of a little bronchitis, made an uninterrupted recovery. Thirty days after the first operation I wished to remove the inguinal glands on the left side, now considerably enlarged but still freely movable. The patient, however, insisted on returning home for ten days. I reluctantly agreed to this, but owing to an attack of pleurisy she did not return to hospital until August 5th. By this time the glands were so extensively invaded that it was impossible to remove them completely.

The patient has fair control over her rectum, though the bowels are moved on an average five times during the day and twice during the night. There have been no symptoms of ascending infection of the ureters and kidneys. This I consider due to the fact that the whole orifices of the ureters into the bladder, and not the ureters only, were transplanted. There has been no recurrence of growth in the vagina.

I cannot help thinking that had the patient consented to earlier removal of the glands the result would have been much more fortunate. The operation itself was tedious but not difficult. The transplantation of the ureters in the depths of the pelvis was a delicate procedure, requiring care and patience, though it was much facilitated by the stay suture.

Rochdale.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PATHOLOGY.

Discussion on the Pathology of Gas Gangrene.

A MEETING of this section was held on Dec. 3rd, Professor W. BULLOCH, the President, being in the chair, when a discussion took place on the Pathology of Gas Gangrene.

Incidence and Bacteriology.

Dr. JAMES MCINTOSH, speaking on researches on the bacteriology of the condition, said that gas gangrene appeared to have been almost unrecognised previous to the Crimean campaign, when it was described under the name of "gangrène foudroyante." Later it seemed to have been confused with various inflammatory conditions, such as hospital gangrene and erysipelas.

On the Western front during the present war its incidence had varied from time to time according to the battle area and the efficiency with which the wounded were dealt, so that reliable statistics were difficult to compile. The incidence among British troops, declining since the early months of the war, has lately only been about 1 per cent. during the most active operations. But even this meant a good deal when many thousands of wounded were being dealt with.

The researches of Pasteur, Koch, Welch, and others showed that the exciting agents were anaerobic bacteria, which were present in all cultivated soils, and thus contaminated the wounds at the time of their infliction. The injured tissues seemed to provide a suitable nidus for the growth of these bacteria, as within a few hours of the infliction of the wound gas gangrene might have already developed. Previous to the outbreak of hostilities Breiger and Ehrlich had shown that the bacillus of malignant œdema (*Vibrion septique*) was capable of infecting man, whilst Welch and Fraenkel demonstrated that the *Bacillus aerogenes capsulatus* had similar pathogenic properties. There was no doubt as to the cause of gas gangrene, but there was considerable diversity of opinion with regard to the most prevalent type, and to the chief features of the types isolated. This was due to (1) the difficulty of isolating many of these anaerobes and of obtaining pure cultures; and (2) the methods of isolation employed in many instances being such as would tend to bring out the saprophytic forms in preference to the more delicate pathogenic varieties. As an indication of the relative incidence of the different anaerobic bacteria met with in cases of gas gangrene, Dr. McIntosh gave some results compiled from his own observations made on behalf of the Medical Research Committee. In a series of 41 cases from 1914–17, *B. welchii* occurred in 43·9 per cent., *B. sporogenes* (types 1 and 2) in 29·2 per cent., *Vibrion septique* in 19·5 per cent., terminal oval sporing bacilli in 17 per cent.; and of undifferentiated types, type No. 13 in 7·3 per cent., type No. 18 in 4·8 per cent., and type No. 19 in 4·8 per cent. In a second series of 52 cases during 1918, *B. welchii* occurred in 67·3 per cent., *B. sporogenes* in 38·7 per cent., *Vibrion septique* in 16·3 per cent., *B. œdematiens* in 4 per cent., terminal oval spores in 8·1 per cent., and *B. pseudo-tetanus* in 2 per cent.

Results of Investigations on Causation and Treatment.

Major J. W. MCNEE laid emphasis on the large number of men who, in the first two years of the war, lost their lives or their limbs from gas gangrene. Owing to the early onset of the complication, which usually developed within the first 48 hours after injury, many cases never reached the base, so that for many workers there could be no clear mental picture of the fulminating cases. The earliest development of gas gangrene which he had seen occurred 3¼ hours after receipt of the wound, and it was often well established in 10 hours. The rapidity of spread was far in excess of any microbic infection of which he knew, and half an hour's delay in operation might make all the difference between life and death. Gas gangrene reached its height during 1915, and at this time meant the death of the patient or, at best, his survival after amputation of a limb.

In 1916, in close association with Surgeon-General Cuthbert Wallace, deliberate work was begun in the First Army on the pathology of the condition, especially by Captain Shaw Dunn and himself. This work arose out of various clinical observations. It was insisted on by Wallace and Kenneth Taylor that gas gangrene was essentially a disease of muscle, and never arose when muscle injury could be excluded. It was also observed that in early cases of gas gangrene single muscles of a group were often involved whilst neighbouring ones escaped. These observations had special reference to gas gangrene spreading in a limb with an intact blood-supply, and the method of spread in such cases formed their first line of research. It was realised that cases of what came to be known as *group* gangrene were in a different category as regards spread. In them a large blood-vessel was always divided—e.g., the popliteal—and gangrene of gaseous type commenced in all the muscles of the group simultaneously. The onset of gangrene in such devascularised segments of limbs was seen to be analogous to invasion of the warm tissues after death, such as occurs in hot weather. Sections illustrating the spread of gas gangrene in living muscle with an intact blood-supply were shown. In their account of their work, which has already been published in full, great emphasis was laid on the *spreading edge of the gangrene*, a histological study of which gave the clue to the method of spread. The essential factor in the spread was the passing up of a fluid substance in the sheaths of the muscle fibres, causing death and coagulation necrosis of the muscle fibres. In the muscle fibres so killed off an invasion by the anaerobic bacilli at once took place, the muscle sugar being split to give the characteristic evolution of gas. It was not until Bull's work on *B. welchii* toxin was published that the full truth was known. They called the spreading edge where the muscle had just been killed off the "pre-gas" zone of gangrene. Experiments on rabbits showed that if the organisms freshly isolated from a human case were injected intramuscularly no spreading gas gangrene followed unless the muscle was first extensively injured or blood clot was produced.

In wounds of this war, in contrast to those of other wars, all the necessary conditions for the origin of gas gangrene were provided. This war had been fought on a heavily manured soil, saturated with the anaerobic bacilli derived from animal manure. We had had the composite bullet, which breaks up readily, and we had had the short-range warfare of the trenches, so that

when a bone was struck it shattered into fragments, tearing up the muscles around. Moreover, we had in this war as never before all the varieties of jagged and irregular missiles, often carrying in cloth along with them, derived from the bursting of shells and bombs of every kind. As a consequence every wound in this war was accompanied by great laceration and damage to muscle, while practically every wound was infected with anaerobes from the start, by clothing, dirt, &c.

During 1916 and 1917 the dead and damaged muscle, in which alone gas gangrene could commence, was removed by operation, and for the treatment of early cases, knowing the method of spread, single infected muscles or parts of them could often be removed in time to arrest the disease, while the limb as a whole was saved. It was obviously necessary that operations should be carried out at the earliest moment possible after wounding, and for this reason the casualty clearing stations were pushed as far up as possible. The results of these measures were very soon obvious. Whereas during the previous year in one C.C.S. the gas gangrene incidence ranged around 8 per cent. in quiet periods, and was known to be almost double in periods of activity when the wounded came back slowly owing to numbers, with the new methods of wound treatment the incidence of gas gangrene fell towards the end of 1917 to just below 2 per cent. This was before any serum therapy had been thought of, and before Bull had announced the discovery of *B. welchii* toxin. During the end of 1917 and the present year the majority of cases of gas gangrene had occurred amongst men who had either had to be brought to the casualty clearing stations over long distances and bad roads, or who had arrived in a pulseless condition from shock or hæmorrhage, or both, and consequently unfit for operation. When gas gangrene is developing the blood pressure rises at first, and the medical officer, unless he is on his guard, may think that the man is recovering.

Speaking of the bacteriology of the condition, he said that in the acute spreading gangrenes of limbs *B. welchii* was evidently the chief organism concerned. It could be found in great numbers, and in almost pure culture, close up to the spreading edge of the gangrene. Such rapidly spreading gangrenes exhibited an intense toxæmia in the later stages, but the organism seldom invaded the blood stream except just before death. During the past year, with the *B. welchii* infections well controlled by surgical methods, other forms of gas gangrene associated more with toxæmia than rapid spread in muscle had consequently come into more prominence. They were of intense toxæmic type, and gave positive blood cultures of a motile anaerobe, the *Vibrion septique*. In his own army area such cases had been rare. With regard to the third great toxin-producing anaerobe (*B. œdematiens*) isolated in cases of gas gangrene by Weinberg and Seguin, he had only seen two or three cases where its presence as the main factor in etiology was suspected. The epoch of serum therapy dated from the time when Bull, working in the Rockefeller Institute, found an exotoxin produced by *B. welchii*, and by the injection of this produced an antitoxic serum. In his work in France he met with many disappointments, but he came at a time when the *B. welchii* infections were already well controlled by surgical methods, and a large proportion of the men on whom he had to make his tests were those developing gas gangrene while lying in a state of shock in the resuscitation wards. The results were encouraging, however, from the way in which some of the toxæmic cases were controlled. In other cases in which the toxæmic symptoms were unchecked, the cultivation of *V. septique* from the blood showed clearly that this organism must be considered in any future serum developments. This year a fairly extensive prophylactic trial was made in three divisions of the First Army with an antitetanic serum containing also anti-substances to *B. welchii*, being controlled by a comparison with neighbouring divisions in the army; the serum was injected as soon as possible after wounding, generally within 3–5 hours. There was no reduction in the case incidence in the C.C.S. zone as compared with control divisions, but the figures seemed to show a reduction in case mortality at the bases. In connexion with the sera used curatively, the cases developing gas gangrene were mostly men in a condition of shock, or in whom operation had been much delayed by long travelling over bad roads. The results were therefore difficult to appraise, and were certainly not dramatic.

Professor M. WEINBERG, the PRESIDENT, Major A. W. M. ELLIS, and Captain H. P. M. HENRY also spoke.

SECTION OF SURGERY.

The Closure of Cavities in Bones.

A MEETING of this section was held on Dec. 4th, Sir JOHN BLAND-SUTTON, the President, being in the chair.

Lieutenant-Colonel PERCY SARGENT read a paper on the Closure of Cavities in Bones.

Processes of Repair in Bone.

He said that the processes of repair in bone differed in no way from those which occurred in other vascular tissues; but they were modified by its peculiar and complex structure. Tissues healed well or ill according to their vascularity, and so cancellous bone was more adapted for recovery than compact bone, and the abnormally dense bone which resulted from chronic inflammation was a great handicap. Another factor which retarded the healing of cavities in bones was the fact that the walls were not collapsible. It was necessary for the walls to be approximated until the granulations which covered them were able to coalesce. Two processes combined to bring about the coalescence of the granulations covering the wall of a cavity: (1) the falling together of the adjacent structures, and (2) the process of contraction which was always associated with the development of granulations. In the case of a bone cavity, it was clear that its walls could not fall together from the pressure of the surrounding structures, nor could they be drawn together by the contraction of the developing fibrous tissue. Colonel Sargent then described a case in which a cavity had been in existence for 16 years after a two-year-old sequestrum had been removed from it, the cavity measuring 3 inches in length, the sequestrum 4 inches. It had taken 16 years for the cavity to be reduced in length 1 inch. We might therefore suppose that the process of filling up a bony cavity, by the growth of new tissue upon its walls, whilst it might slow down, did not necessarily come to an end completely; that, although in theory a cavity of any size might ultimately be obliterated in this manner, the process would be so slow as to need longer than the life-time of the patient—a life-time apt to be shortened by chronic septic absorption, or by any of the accidents which threatened a patient who bore a source of chronic suppuration.

Methods of Filling Cavities in Bone.

The problem of filling up old bone cavities had been attacked in different ways:

1. In 1836 Schede recommended a procedure based upon the process of "healing by blood clot." His method was as follows: An Esmarch's bandage having been applied to the limb, the cavity was prepared with the greatest care so as to render it as clean as possible, and the wound was closed. On removal of the bandage the cavity would fill with blood, which, the wound being relatively aseptic, would become organised into, or replaced by, fibrous tissue.

2. Pieces of sponge had been packed into the cavity, in the expectation that such tissue would form a framework for the growth of granulations.

3. Neuber's method consisted in laying open the cavity by removal of one of its bony walls and inverting flaps of skin into the groove so formed, the flaps being secured in position by means of nails.

4. Senn advocated the use of decalcified bone which had been prepared by soaking in 1 in 500 sublimate alcohol. The cavity, carefully prepared, and rendered as aseptic as possible, was to be firmly packed with chips of this decalcified bone.

5. A method of plugging bone cavities with a paste compounded of iodoform, spermaceti, and oil of sesame, was described by Moorhof and Seymour Jones in 1905. The cavity to be treated was to be cleaned, dried, and filled up with this paste, which was stated gradually to disappear, and to be replaced by bone. Moorhof claimed to have treated 220 cases in this manner without a failure. Both the last described method and that of Schede demand conditions which must rarely be attainable. "It is an absolute *sine qua non*," wrote Moorhof and Jones, "that the walls of the cavity to be plugged should contain no diseased tissue, and should be perfectly aseptic."

6. Another method of filling the bony cavities was described by Hollander. The cavity was carefully cleansed and prepared, and was then filled up by pouring melted human fat into it. The fat so obtained at operation from lipomata or omentum was freed from connective tissue and melted in a water-bath. It was claimed that in some instances healing by first intention occurred, but that in the majority the wound took about three weeks to heal. It was further stated that the scar, instead of being adherent to the bone and depressed, was freely movable and flush with the surface.

7. Professor A. Broca said that the persistent sinus was due to the persistence of osteitis and the existence of a suppurating cavity, the obliteration of which should be at least as much the object of operation as the removal of sequestra. Broca's radical operation aimed at the obliteration of the cavity by the falling in of the soft parts. The bone was freely exposed through an incision situated at the most convenient place as regards its anatomical relationships; existing sinuses at a distance from the site of election were ignored. The cavity was converted into an open trough or gutter by the free removal of one of its walls. Any sequestra and all diseased tissue were removed, special care being taken to follow up all recesses and diverticula from the main cavity. The overlying soft parts were then encouraged to sink into and gradually to obliterate the resultant cavity.

Technique of Modification of Broca's Operation.

The method which the speaker wished to advocate was a modification of Broca's operation, and one which he thought in most cases offered certain definite advantages. It might be called that of muscle-grafting, to which might be prefixed the term (as Professor Shattock suggested) "continuous"—in contradistinction to "discontinuous"—grafting, seeing that the slip of muscle used to fill the cavity was not completely separated but retained its continuity with the main mass. Before undertaking the operation the bone was carefully examined by means of stereoscopic radiograms.

The technique of the procedure was as follows. No tourniquet was employed. The use of a tourniquet certainly rendered certain stages of the operation more easy, but the subsequent oozing was a great drawback. Hæmorrhage was easily kept under control by the frequent application of large pieces of gauze wrung out in very hot saline. As a rule, the operative field could be kept dry by this means. Further, it was easier to judge of the condition of a bone which bleeds under the curette than of one which was temporarily deprived of its blood-supply. Again, as these operations consumed a considerable amount of time, the total deprivation of blood for an hour or more of skin whose nutrition was already impaired by scarring might result in subsequent sloughing. One of the most essential points in the operation was to secure a sufficiently thorough exposure of bone both above and below the site of the cavity which was to be attacked. The surgeon must see exactly what he was doing in every part of the operative field, and not trust to the curette for discovering hidden recesses. He usually began by a fairly wide excision of the wall of the sinus which leads down to the bony cavity. When more than one sinus existed he selected the one which was most conveniently situated and which gave the easiest and most direct access to the bone, having regard to the anatomy of the structures in the neighbourhood. Any other sinuses might or might not be dealt with, according to their situation and the density of their walls. The periosteum was next incised to the extent of the whole length of the wound and stripped from the bone so as to bare it completely, not only at the actual site of the cavity, but for some distance both above and below. At this stage it was convenient to employ Lane's bone levers instead of the ordinary retractors so as to bring the bone into prominence by depressing the soft parts; they were inserted between the periosteum and the bone. Before attacking the bone it was necessary to pack it off by means of gauze pads, partly to prevent soiling of the wound generally, but particularly to prevent fragments of bone getting lost amongst the soft parts and being accidentally left behind. This was most important, more than one of his own failures being due to the leaving behind of bone chips. That part of the operation which consisted in preparing the cavity for the graft was entirely subperiosteal. The bone so exposed could be thoroughly examined, and a decision made as to which wall of the cavity could best be spared from the point of view of strength of the bone. Other things being equal, that aspect of the bone was selected for removal which was most conveniently related to such overlying muscles as could best be employed for filling the cavity. These points being decided, the cavity in the bone was fully opened up by means of a chisel and mallet until every part of it could be thoroughly explored. All granulation tissue and dead or carious bone must be removed, and all recesses carefully followed up and cleansed. The cavity was next washed out with hot saline solution and plugged tightly with gauze. This completed the first stage of the operation.

The second stage was not commenced until all soiled packing had been removed, the towels changed, the instruments re-sterilised, and the surgeon's and assistant's gloves had been changed. From this point onwards the operation must be regarded as an aseptic procedure. The wound of course was not free from bacteria, but their number had been so reduced that the tissues could deal with the remainder. The best method of filling the cavity with muscle was different in every case: what one must do was to fashion from the most conveniently situated mass of muscle a thick, broad-pedicled flap of approximately the same size as the cavity. It was a plastic operation based upon the same principles as those which govern plastic operations in general, and the main point to be kept in mind was to secure an adequate blood-supply to the transplanted muscle. The muscle graft was now pushed into the cavity and pressed home firmly; it readily adhered to the bone. A few stitches of catgut might be required to bring together the overlying muscles and to assist in keeping the graft in position. The skin was loosely sutured and the subsequent escape of exudate was provided for by means of rolls of rubber sheeting inserted in convenient parts of the wound. It was important to place one such drain in the space from which the muscle graft had been cut. These drains were usually removed at the end of 48 hours. The limb was splinted in such a way as to relax the parent muscle.

In some cases these wounds had healed practically by first intention, but there was often a considerable reaction, which might last for several days, the temperature being raised to 101° or higher and the wound discharging a quantity of exudate, which was sometimes thin and watery and sometimes frankly purulent. In one or two instances severe suppuration had occurred, but the wounds had, nevertheless, eventually healed soundly.

Advantages of the Muscle-graft Method

The advantage of the muscle graft over the method of Broca was that less bone need be removed, and it was not necessary to convert the whole cavity into an open gutter. Hence the bone need not be weakened to the same extent. (Broca spoke of fractures having occurred during his operation.) Further, the cavity often extended into the articular end of a bone, in which case it could not be converted into an open trough in its whole extent. The obliteration of the cavity by the falling in, or pressing in, of the overlying soft parts might take some time, and might fail to be complete; by means of muscle grafting we got an immediate and entire filling up of the space. In contrast with the other materials which had been used, we had in muscle a living vascular tissue which might be presumed to furnish cells and fluids capable of completing the removal of such micro-organisms as might remain. It was possible that, in parts at least, union between the raw bone and raw muscle might occur by first intention, or the bone and muscle might each become covered with granulations which might subsequently unite. In either case the respective blood-vessels of bone and muscle coalesced, so that an additional supply of blood was brought to the bone. We had no evidence that bone formation occurred in the graft, but it might conceivably occur should the parts concerned be not strictly aseptic, and the graft become the seat of a chronic myositis. The graft retained its connexion with the parent muscle and might take with it a nerve supply, in part at least. It need not cease to function if the arrangement were such as merely to make the transplanted slip arise from, or shift its insertion into, another part of the bone. The fate of the graft was a matter of subsidiary importance; for if the procedure had successfully obliterated the cavity, its real object had been attained—namely, sound and final healing. Whether ossification ultimately would take place

was immaterial from the point of view of strength, for, as the patient used the limb, and so subjected the bone to strains and stresses, compensatory overgrowth occurred. This was well exemplified in a radiogram taken by Captain Keen.

Discussion.

Captain B. S. SIMMONDS spoke of the work he had carried out with Colonel Sargent and Major Oswald Shields at Tooting Military Hospital in dealing with gunshot fractures which were unhealed, owing to the presence of septic tunnels and cavities in bone. Their object had been in all cases (1) to expose freely by periosteal resection the whole area of the injury to the bone; (2) to open up thoroughly the cavity or tunnel so that its whole extent could be explored; (3) to remove all sequestra and diseased bone, and the fibrous tissue and granulations lining the cavity or tunnel; and (4) to arrange for soft parts to fill up the cleaned cavity completely. He thought that every case should be treated on its merits without one method exclusively being adopted. Many cases of tunnel and cavity which could, without removal of too much bone, be converted into a shallow cavity could be cured by Broca's method; but other cases, such as cavities involving the condyles of the femur, and cavities in which removal of sufficient bone would endanger the function of the limb, were best treated by the muscle graft.

Captain Z. MENNELL said that during the past year he had performed this operation on about 27 cases, 23 of which could be traced. He wished to emphasise certain points: 1. The need for complete excision of the sinus which leads to the bone cavity and of the surrounding scar tissue. It was essential that the incision should run through healthy skin, so that the stitches need not pass through scar tissue or sustain any tension. 2. The careful packing off of the wound so as to avoid bone chips being overlooked. 3. The muscle tissue used as a graft must be muscle tissue only, without tendon or fascia attached to the surface which comes into contact with the raw bone surface. The graft must have a good blood-supply and be free at one end. 4 Efficient drainage of the cavity from which the muscle has been taken through a separate wound in the most dependent position possible. 5. The need for firm pressure over the muscle in the cavity when the dressing was applied. 6. Careful examination of each case for any interference of the blood-supply to the limb. Referring to the after-effects, he said that there was very considerable oozing. This need not cause alarm, and only necessitated packing the wound outside the original dressing and perhaps a firm bandage in addition. There was often considerable reaction and sometimes, in addition to constitutional symptoms, such as fever, an apparent severe local infection. This only lasted a short time, and if there was sufficient drainage no ill-effects appeared.

Mr. C. H. FAGGE and Major OSWALD SHIELDS also spoke.

Major JOHN R. LEE read a paper on Compound Fractures of the Femur in its Upper Third and demonstrated his pelvis-femur splint, and also a splint for fractures of the upper extremities. The paper will be published in a later issue of THE LANCET.

SECTION OF ANÆSTHETICS.

The Present Position of Spinal Anæsthesia.

A MEETING of this section was held on Dec. 6th, Dr. LLEWELYN POWELL, the President, being in the chair.

Dr. F. S. ROOD opened a discussion on the Present Position of Spinal Anæsthesia. He said that he had nearly always used a 5 per cent. solution of stovaine, the density of which was increased by the addition of 5 per cent. of dextrose. He preferred this to a solution of stovaine in saline. The difficulty of the conscious patient was overcome by combining general anæsthesia or a modification of twilight sleep with spinal anæsthesia. The question of shock was discussed, spinal anæsthesia having been given up in the military hospitals in France owing to the danger of administering it to patients who would be seriously affected by a fall in blood pressure. On the other hand, spinal anæsthesia protected patients from the onset of shock due to prolonged and severe surgical procedures. Difficulties due to a fall of blood pressure in his own cases had been much less frequent since the adoption of the recumbent position. Dr. Rood's paper will appear in full in a later issue of THE LANCET.

Mr. P. LOCKHART-MUMMERY said that the object of anæsthesia was to protect the patient from loss of vital energy, which occurred in two ways: (1) by afferent impulses reaching the brain from the site of operation; and (2) by fear. Inhalation anæsthesia protected the patient against fear, but not against impulses reaching the brain; spinal anæsthesia protected against pain but not against fear, and fear affected the patient as much as pain in producing a lowered blood pressure. It was therefore advisable to use both forms. The best results he had seen yet had been from a combination of twilight sleep and spinal anæsthesia, but it was difficult to estimate the amount of scopolamine-morphine needed. The greatest advantage of spinal anæsthesia was that it did not produce vomiting. It was necessary to keep up the vital energy by feeding, and with spinal anæsthesia the patient could be fed until the time of the operation, and food could be given immediately afterwards. This made a very marked difference. During the last five years he had reduced his mortality from excision of rectum from 30 to 40 per cent. to 5 per cent. With regard to the question of shock, it should be realised that under spinal anæsthesia the patient was under the influence of gravity (the case being comparable to that of the hutch rabbit) and so must be kept head downwards. The careful moving of the patient afterwards was of extreme importance.

Mr. P. P. COLE said that with regard to the prevention of shock, the posture and the maintenance of the same position after operation were both very important. Such operations as that for a large umbilical hernia in a very stout woman should not be done without spinal anæsthesia, owing to the strain on the stitches when vomiting occurred. If vomiting were eliminated the success of the operation was assured. Spinal anæsthesia was also invaluable in prostatectomy and for all urethral work; with it he had never found an impassable stricture. It was also very useful in emergency operations in acute abdominal conditions where the surgeon was single-handed.

Mr. ROBERT DONNELLAN said that he had administered spinal anæsthesia for some years in thousands of cases. He preferred the saline form, because the operation could be begun at once and because pallor, sweating, shock, and collapse were less than with the glucose solution. Temperament played a large part; there was far more shock, sweating, &c., in the case of nervous patients. He asked if stovaine was a vaso-dilator. He had watched the pulse and had found the radial pulse large, soft, and flabby before shock came on. He had had a certain number of cases of retention of urine due to atony of the bladder, in which catheterisation was needed for some days.

Mr. H. M. PAGE said that he had begun by using the heavy solution and had gone on to the light, and did not wish to change. With the patient in the Trendelenburg position he had seen no shock, vaso-dilation, collapse, &c. Paralysis of eye muscles and headache also occurred after spinal puncture for fluid.

Dr. F. E. SHIPWAY thought that the fall of blood pressure was the chief question. It did not depend upon the lightness or heaviness of the solution used so much as on the paralysis of a large portion of musculature. He asked if the headache was a nervous phenomenon and due to the patient being apprehensive.

Dr. J. BLOMFIELD thought that Crile had underrated the power of general anæsthesia in preventing shock. It was difficult to produce shock in anæsthetised animals. Spinal anæsthesia was of great value in selected cases; he found it of most value combined with general anæsthesia.

Dr. ROOD, in reply, said that a fall of blood pressure superimposed on shock was dangerous. If the patient were in such a condition it was unsafe to give an anæsthetic which cut out the splanchnics. He had never seen a case of continuous retention of urine.

DEVON AND CORNWALL SANATORIUM FOR CONSUMPTIVES, DIDWORTHY.—The fifteenth annual report shows that during the year 148 patients were admitted in the first stage of tuberculosis, 155 in the second stage, and 20 in the last stage. Of the last-named cases half were discharged improved. The average stay of each patient was 90 days. The average cost per case amounted to just over 35s. weekly. The income was £5883, and an unfavourable balance of £191 remained.

Reviews and Notices of Books.

I. *A Short Practice of Midwifery.* By HENRY JELLETT, B.A., M.D., F.R.C.P.Irel. Seventh edition, revised. With 4 coloured plates and 236 illustrations. London: J. and A. Churchill. 1918. Pp. 545. 12*s.* 6*d.* net.

II. *A Short Practice of Midwifery for Nurses.* By HENRY JELLETT, B.A., M.D., F.R.C.P.Irel. Fifth edition, revised. With 6 plates and 169 illustrations in the text; also an Appendix and a Glossary of Medical Terms. London: J. and A. Churchill. 1918. Pp. 464. 8*s.* 6*d.*

I. THE present edition of this well-known text-book has been revised and seen through the press under the stress of war conditions in Flanders. In spite of this, the revision appears to have been carried out carefully and thoroughly, and it remains one of the best short text-books on the subject of midwifery. Naturally, it reflects the teaching of the Rotunda School, of which the author is so widely known an exponent. In the chapter on Eclampsia we notice that the rapid emptying of the uterus is not regarded with much favour. The question is a difficult one, but in view of the increasing number of advocates of the rapid termination of the pregnancy by the performance of Cæsarean section it is interesting to note the recommendation that if the patient's condition is becoming worse in spite of the medicinal treatment advised the uterus should be emptied after the use of Champetier de Ribes's bag or Frommer's dilator. Surely a more rapid and more surgical method in such a case is the performance of an abdominal Cæsarean section. The uterus can be emptied with greater safety by this method than by any vaginal operation. But apparently the author rejects Cæsarean section altogether, and would use in preference a Frommer's dilator, an instrument the employment of which most obstetricians have abandoned. It must be admitted, however, that the routine medicinal treatment as practised by the author and others, such as Stroganoff, has given very good results. A work which has reached its seventh edition requires no recommendation on our part; we endorse the favour with which it has been received by students and teachers.

II. The present edition has been carefully revised and brought into conformity with the existing practice of the Rotunda Hospital. A number of new illustrations have been added and others have been redrawn. As Dr. Jellett points out in his preface, the first duty of a nurse when the labour she is attending is not a normal one is to send for medical assistance, and her second duty is to do the utmost for her patient that she can until assistance arrives. She cannot perform the second of these duties, nor can she give intelligent aid to the medical man, if her knowledge is limited to the bare essentials which will enable her to conduct a case of normal labour. For the purpose of acquiring a theoretical knowledge of the other details of the management of a pregnant, parturient, and puerperal woman, a nurse cannot do better than consult this book by Dr. Jellett. In it she will find clearly and concisely described all the facts she should know, and we can confidently recommend it to all nurses studying midwifery.

Gynecology. By WILLIAM P. GRAVES, A.B., M.D., F.A.C.S., Professor of Gynæcology at Harvard Medical School, &c. With 368 half-tone and pen drawings by the Author, and 123 microscopic drawings and 100 illustrations in colour. Second edition, thoroughly revised. London and Philadelphia: W. B. Saunders Company. 1918. Pp. 883. $7.75.

IN the second edition of this book the section on the relationship of gynæcology to the internal secretions has been rewritten almost entirely and considerably amplified. This subject is one of the greatest importance to the gynæcologist, and how thoroughly it is treated by the author is shown by the fact that he devotes some 130 pages to it. A new section also has been added dealing with the relation of gynæcology to the sex-impulse, largely based upon the theories of Freud regarding infant sexuality. Other interesting additions are to be found in the sections dealing with ovarian organotherapy, ovarian transplantation, the radium treatment of cancer, and the use of radium in non-malignant gynæcological diseases. A special description is given of the very thorough operation for cancer of the vulva in two stages recommended by Taussig. Indeed, the portion of the book dealing with operative gynæcology is particularly interesting, as a number of operations are described which are not to be found in the ordinary text-books—for example, the author's method of performing anterior colpoplasty, Clark's perineoplasty, and Studdiford's modification of the same operation. Another useful procedure described is Bartlett's method of transplanting a portion of the fascia lata from the thigh in the treatment of ventral hernia. The whole work is most interesting and beautifully illustrated, upon which we can heartily congratulate the author, and it should be read by all teachers of gynæcology.

Simplified Method of Tracing Rays through Any Optical System. By LUDWIK SILBERSTEIN, Ph.D. London: Longmans, Green, and Co. Pp. 37. 5*s.*

THERE is something very fascinating about the apparent (but deceptive) simplicity of quaternions and vector analysis, but it is well to remember that such a good mathematician as Lord Kelvin confessed that for years he was unable to understand Heaviside's vector analysis. Dr. Silberstein, however, tells us in his preface that only the rudiments of vector algebra are involved in this little book, and that "a reader who is entirely ignorant of the subject could in a few hours acquire this amount of knowledge from one of the existing treatises on it." We think the author has underestimated the elusiveness of the method. For instance, on p. 17 a simple vector formula is said to show

"at a glance an interesting and perfectly general property of the prism. ..... Thus the final emergent ray makes with the edge (!) the same angle θ as the original incident ray, whatever its orientation. In other words, the only effect of the prism is to *turn the ray rigidly round the prism edge* as axis." (The italics are the author's.)

This statement is not a mere slip, for it is repeated on p. 27. It is, however, well known that the deviation of a ray due to the interposition of a prism is the angle between the incident and emergent ray, so that the axis, about which the ray is turned, passes perpendicularly through the intersection of these rays, and not through the edge of the prism. The book cannot therefore be recommended in its present form, and the 18 blank pages at the end might well be utilised in the explanation of the fundamental principles of vector analysis required in tracing rays by this method.

Reminiscences of a Student's Life at Edinburgh in the Seventies. By ALISMA. Edinburgh: Oliver and Boyd. 1918. Pp. 115. 4*s.*

THIS is a pleasant, modestly written little book of recollections of various events and people, and we may at once say that the people are far more important than the incidents which are mentioned in connexion with them. "Alisma" plunges at once into his subject with a reminiscence of Professor John Hutton Balfour, Professor of Botany (1845–79), who had told "Alisma" a botanical riddle the answer to which is the calyx of the wild rose, and it ran thus:—

> Quinque sumus fratres, unus barbatus et alter,
> Imberbesque duo, sum semiberbis ego.

(Two of the sepals of the calyx are bearded, two are not, and one is bearded on one side only.) This riddle in one form or another is of great antiquity, and John of Gaddesden, our first English Court physician, used it to describe the sections of his Rosa Anglica in this form:—

> Tres sunt barbati, sine barba sunt duo nati,

signifying that of the five books into which his treatise was divided three were long and two were short.

Among other names of famous men mentioned by "Alisma" are Blackie, Crum Brown, Chiene, Christison, Turner, Huxley, and Lister. The last chapter recounts how the author returned after a lapse of 15 years to receive his Doctor's degree, and how he experienced that mournful feeling of loneliness which all of us who have been educated at a public school or university have felt on returning to the scenes of our youth. But the book will recall pleasant memories to all Edinburgh men of the period dealt with, and will serve for some half-hour to make them renew their youth as the eagle when they read it.

THE LANCET.

LONDON: SATURDAY, DECEMBER 14, 1918.

Medicine and Aviation.

THE Report of the Civil Aerial Transport Committee, issued last week by the Air Board, makes it certain that the developments of aviation during four years of war will find expression in the life of the world during the peace upon which we are now entering, and within which we aspire to abide for the future. The report indicates that certain types of flying machines will be promptly available for use upon the air routes of the globe, not only for mail and parcel traffic, but also for business, travel and even pleasure touring. With respect to the organisation of this tremendous revolution in transit and transport much, of course, remains for discussion. Of the character of the machines, it is obvious that they will have to be made to suit the circumstances of their employment, and elaborate rules will have to be laid down for the maintenance of certain streams of traffic. Similarly, the establishment of adequate aerodromes will be required, as well as landing-stages and garages, so that convenient starting- and stopping-places may be at public disposal. Systematic meteorological observations will have to be arranged, and as some of the activities postulated will not only entail flying by night, but to some extent flying at regular intervals in accordance with a time-table, weather forecasts will be needed, as well as knowledge of air currents at high altitudes. All this information must be forthcoming and available for ready distribution. It is clear that before a regular commercial air service can be established a vast amount of preparation remains to be undertaken.

But that regular aircraft services for various purposes will come into being no one can doubt who has followed in imagination the intensive experience obtained by the flying services in the course of the war—experience that will be largely wasted unless it is to form the foundation of the new developments. This experience has been of a terrific character, associated in many cases with violent death and permanent injuries, although the highest medical talent has been freely placed at its disposal. Without this medical service, which grew up almost within a night at the call of urgent need, flying would still be in large measure the approach to suicide which it was a decade ago. Obviously, the pleas which have been put forward for a first-rate medical service attached to the Royal Air Force during the war hold good also for the aviation service which peace brings in. The human bird, whether vulture or carrier-pigeon, is exposed to many and peculiar strains requiring close and special medical supervision if accident is to be avoided. The flying man is an artificial combination in which man and machine become to all intents and purposes one. Histologically such a symbiosis has generally taken æons to evolve. The last few years, and especially the last year of all, have seen its meteoric development in the airman; but its maintenance will for that very reason require the more systematic care. The principles on which personnel is chosen will require working out. The physiology and psychology of candidates for service must be closely scrutinised, as the responsibility in life and limb of the recruiting officer will be a very heavy one. Recruiting officers must form part of a highly equipped and properly trained service. Of all factors probably the most important in the art of flying is the coördination and prompt action of reflexes necessary for the successful management of mechanical accessories which have become part of the human person. It has been stated, and we have never seen it contradicted, that in practically no other accomplishment has the man to keep so many groups of antagonistic muscles in a state of static wakefulness, or to perform such a variety of coördinated leg and arm movements. The statement was made with reference to the management of fighting machines, where alone experience can be quoted. But while the more stable commercial machines will not make such demands, the need will still remain that the period of training for flying should be adequately long; and it also means that the candidate, when found physically fit to fly, should be able to call during his training for the best medical advice, and to feel that he is receiving responsible care, which does not mean grandmotherly supervision.

How the selection of aviation candidates is to be accomplished is the subject of an exhaustive article by Dr. G. A. SUTHERLAND in our columns this week. Medical examination of would-be-flyers is the first link in a chain which should support every flying service at every stage. Dr. SUTHERLAND, writing as a late member of the Special Medical Board of what was the Royal Flying Corps, begins with detailing the essential qualifications for air service, and goes on to indicate the special conditions of the cardio-vascular and nervous systems which make the candidate a likely or an unlikely flyer. This examination involves points more difficult than the essential integrity of the sense organs, which is comparatively easy to determine. Only during a preliminary period of probation will some of these points become clear. Ground training of candidates will include athletic sports, not only to keep them fit but to afford medical indications both on the physical and temperamental sides. Much has been said that is wise, and much that is less than wise, concerning the temperament of the aviator, and a large proportion of these reflections have been made with the fighting man alone in mind. Aviation, when it becomes a branch of the Civil Service or a part of our domestic machinery, will remain for the present a dangerous occupation, or we should not be claiming that those who pursue the occupation should have at their beck and call a highly qualified medical service. But with the disappearance of war there goes a class of risk which called for an ultra-courage and activity. For those heroic

souls, whose absolute fearlessness, love of adventure, determination to overcome difficulties, and devoted patriotic obedience played so large a part in the war, a white-hot enthusiasm was necessary which will hardly be at the disposal of commercial life. And with that fact vanishes the force of much of the lurid writing about the temperament of the flying officer, but in no way whatever is proper medical supervision of commercial flying rendered unnecessary. It is urgently necessary.

Beer, Germinated Beans, and Scurvy.

THE processes of seed germination and the complex and interesting changes involved therein have long attracted the attention of chemists and biologists. The subject received the most earnest and fruitful study when science came to the aid of the brewing industry, and it is worthy of observation that both chemical and biological science gained greatly by the researches connected with the brewing of beer. The maltster did but imitate the natural processes of germination by soaking the grain in water under favourable conditions until it sprouted—a period of growth which meant the beginning of important changes in the constituents. It meant the development of the enzyme which transformed insoluble starch into soluble sugars, and these being capable of fermentation became further simplified and were succeeded by alcohol showing the constitution of water, in which one hydrogen atom is replaced by the ethyl group. That seems simple chemistry enough, but the changes are more complex than thus described, for besides dextrins and sugars there are other very important products elaborated which, though present in minute amount, are now found to exercise a remarkable influence on the human metabolism. In an interesting historical sketch which we publish this week, by Mrs. ALICE HENDERSON SMITH, on "Beer and Scurvy," reference is made to the value of fresh germinated barley as a material possessing marked antiscorbutic potency, which is preserved in the beer produced from the malted product so long as it is not dried at too high a temperature. In an account in THE LANCET of Oct. 19th of an outbreak of scurvy in the South African Labour Corps Dr. HAMILTON W. DYKE observed the useful place taken by kaffir beer in the diet of these natives, which would appear to confirm and justify the belief in the value of beer as an antiscorbutic used in the Navy 120 years ago. Under, however, modern methods of malting and brewing the antiscorbutic element appears to be largely, if not completely, eliminated. Recent experiments, again, made by A. HARDEN and S. S. ZILVA with beer made from kilned malt led to the conclusion that the malt liquor so made was deficient in antiscorbutic properties, a conclusion which explains the history of its failure as a defence against scurvy in certain of the Arctic expeditions. Beer made by modern methods may therefore be ruled out as of any value as an antiscorbutic, but the fact that the process of germination develops an antiscorbutic factor must not be lost sight of.

In describing the distribution among foodstuffs of the vitamines needed for the prevention of beriberi and scurvy, Dr. HARRIETTE CHICK and Miss E. MARGARET HUME[1] have demonstrated by animal experiments that germinated pulses are richly endowed with antiscorbutic vitamine, and they made the practical suggestion that in order to prevent scurvy, if a supply of fresh fruit is not procurable, germinated pulses should be added to the diet. In our columns this week we publish a very interesting note "On the Value of Germinated Beans in the Treatment of Scurvy and Some Points on Prophylaxis," by Dr. H. W. WILTSHIRE, who had under his observation in 1917 many Serbian soldiers affected with scurvy, and when the disease became prevalent again this year an attempt was made to test the value of germinated pulses in treatment. The clinical results he reports confirm the experimental results of Dr. CHICK and Miss HUME, and "permit the definite conclusion that dry beans develop, upon germination, an amount of antiscorbutic vitamine at least equal to, if not greater than, that contained in fresh lemon juice." The results are remarkable, for they show that the use of germinated pulses is capable of practical application for the effective prevention of scurvy, and in the opinion of Dr. WILTSHIRE this would be the easiest and cheapest method by which to prevent the occurrence of scurvy in an army in the field.

All this should give fresh stimulus to probe further into the exact nature not only of these antiscorbutic elements, but of the antineuritic elements also. In neither case has a specific substance been isolated, and consequently no definite chemical constitution can be ascribed to them. It would appear that all attempts to isolate an exact substance by well-known methods of separation are frustrated by an instability of character. These accessory food substances, for instance, will not survive prolonged heating and alkalies are fatal to their activities, which would seem to point to their being of a basic nature, the alkali setting free possibly a nitrogen group. We know that the antineuritic element can be differentiated from the antiscorbutic element by adsorbents. Fuller's earth, for example, adsorbs, as HARDEN and ZILVA have shown,[2] almost quantitatively the antineuritic factor out of autolysed yeast, but does not reduce the antiscorbutic potency of orange juice, so that in a fluid containing autolysed yeast and orange juice the antineuritic factor is removed, while the antiscorbutic activity remains unimpaired. The same authors[3] have shown, again, that by eliminating the free citric and other organic acids in lemon juice an antiscorbutically active residue is obtained, and therefore these organic acids are not concerned in the prevention of scurvy.

[1] Harriette Chick and E. Margaret Hume: The Distribution Among Foodstuffs (especially Those Suitable for the Rationing of Armies) of the Substances Required for the Prevention of (*a*) Beri-beri, and (*b*) Scurvy. Journal of the R.A.M.C., xxix., No. 2, August 1917, p. 121.
[2] THE LANCET, July 13th, 1918, p. 52.
[3] Biochemical Journal, October, 1918.

It is to be hoped that the chemistry of these accessory factors will soon be cleared up and a method found for their isolation in the pure state. Biologists have done well in developing this new scientific aspect of dietetics, and so far chemists have not kept pace with them. We may appropriately, in connexion with the whole subject, congratulate Professor FREDERICK GOWLAND HOPKINS, University Reader in Chemical Physiology and Prælector in Bio-chemistry in Cambridge University, on having been awarded at the last annual meeting of the Royal Society, held on St. Andrew's Day (Nov. 30th), the Royal Medal of the society. As stated on the occasion of the presentation of the medal, Professor HOPKINS was among the very earliest, if not actually the earliest, to recognise and announce that minute quantities of certain bodies, the nutritive value of which had hitherto been unsuspected, exert an enormous influence upon growth and upon normal adult nutrition. He showed that without these accessory factors a diet otherwise full and seemingly complete is incapable of allowing growth and even of maintaining body-weight or life. Subsequent events have abundantly proved what a valuable observation in dietetic research was thus made.

Demobilisation and Venereal Diseases.

THE Local Government Board is alive to the very pressing danger of the mobilisation of venereal diseases on demobilisation of the Armies to which we made extended reference last week. The Board has issued a circular (V.D.19) to county and borough councils, asking them to secure at once a considerable extension of facilities for the free treatment of venereal diseases. In the first instance arrangements are suggested for more frequent clinics, including evening sessions at existing treatment centres, and in the second for the provision of additional centres. The Board suggests that in many cases it will not be practicable to provide sufficient centres by arrangement with the voluntary hospitals, and that it will therefore be necessary for the borough councils to make arrangements on their own premises, possibly utilising a tuberculosis dispensary or isolation hospital. For the treatment of gonorrhœa, in the intervals between the clinics treatment by a trained nurse or attendant (subject to medical supervision) is suggested, the treatment to be given either at the hospital where the treatment centres are or at new auxiliary centres. The latter should also serve the requirements, between the dates of attendance of the doctors at the regular clinics, of persons who are apprehensive that they may have contracted disease, although no medical diagnosis has yet been made. Borough councils of the larger areas are urged to consider at once the desirability of appointing whole-time venereal disease officers. Negotiations are proceeding with the naval and military authorities for the early release of doctors specially experienced in the treatment of venereal diseases, of whom a list will shortly be available.

Annotations.

"Ne quid nimis."

A NATIONAL TRIBUTE TO VOLUNTARY AMBULANCE WORKERS.

A LETTER from Lord Ranfurly in another column calls attention to the admirable work, extending over 40 years, which has been done by the Ambulance Department of the St. John Ambulance Association. And in our correspondence columns last week Sir Rickman Godlee and Sir James Cantlie, respectively President and Principal of the College of Ambulance, Vere-street, W., entered a plea for funds in order that the College may have an assured income, and be enabled to carry out in peace time the useful—the immeasurably useful—work which it has done during the war. Everyone should recognise the important part which first-aid teaching has played in the saving of life during the war, while the Home Office regulations with regard to emergency treatment in factories is a proof of the value of prompt surgical aid in the civil direction. First-aid is, indeed, an essential adjunct to medicine and surgery; immediate attention after injury, wherever it may take place and by whatever means, often saving lives, and always assisting treatment. It should be realised that men, women, and children of these islands also leave the homeland to reside under unusual climates and in thinly populated districts, as the need of the workers dictates, and these localities are surrounded by many dangers to health which are new to them, and which present themselves in circumstances where the threatened persons are bound to depend on their own ingenuity. A part of the work of the College of Ambulance is to guard against these dangers. At any time the healthy individual life is an asset to the nation, but at the present moment such a life has an artificial value when war has left its hideous mark on the population. The College of Ambulance was founded in September, 1914, when Sir James Boyton gave the magnificent buildings, 3, Vere-street, London, as a home for the College free of rent for a year, the expenses of the work being paid in part by the fees of the pupils, and Sir James Cantlie giving his services as teacher free. In September of the present year the incorporation of the College took place, and now, if the institution is to form a sufficiently noble memorial to the thousands of voluntary workers who have given their services to the country in time of need, and adequately play its part in the reconstruction work that is before us, it is necessary that substantial financial aid should be forthcoming. The very nature of the work prevents it from being self-supporting, for large teaching fees cannot be asked from those who freely give their services to the country without pay. The sum required to establish the association on a permanent basis as a national memorial is £100,000, and Lord Mount Stephen has started the list of subscriptions with £500. We hope the appeal will receive the whole-hearted support of both the public and the medical profession. Subscriptions should be sent to the Honorary Treasurer, 3, Vere-street, London, W. 1.

AN ANOMALOUS DISEASE.

THERE was a curious epidemic at Taranto in May and June of this year, attacking the civil population and the crews of the men-of-war. Ships might

have three or four hundred cases on board in a very few days. Luckily the cases only lasted two days usually. The very young and the very old were not attacked. The disease was clinically differentiated from dengue, influenza, and pappataci fever, and a *Micrococcus tetragenus* was found in the blood and pleural exudate; a streptococcus was sometimes present. The disease was characterised by pharyngitis, headache, pain in the back, pyrexia (104° even), and in severe cases pneumonia, pleurisy, albuminuria, enlargement of spleen. Endocarditis is mentioned in the post-mortem report of ten fatal cases. Gargling the throat is mentioned as a prophylactic, and in treatment aspirin is forbidden, as weakening of the heart is specially feared. Relapses did not occur, so some immunity is probably set up. We quote from the report of Lieutenant-Colonel Saccone in the *Annali de Medicina Navale*.

WAR NEPHRITIS OR TRENCH NEPHRITIS.

AMONG the many controversial questions raised by the conditions of medicine and surgery which seem to be directly dependent upon war the problem of war nephritis or trench nephritis occupies a prominent place. There seems to be little doubt that its incidence is determined entirely by war conditions. It affects almost exclusively troops in the front line, civilians having in great proportion escaped. Few cases occur amongst officers or in units that are well housed. Numerous theories have been evolved, most of them speculative in character and based upon little evidence, though there seems to be an increasing consensus of opinion in favour of an infective agent in the causation. We published in a recent issue of THE LANCET an admirable summary of the clinical features of this disease by Professor H. B. Day,[1] Professor of Clinical Medicine, Egyptian School of Medicine, based upon a careful personal study of 50 cases in the early stages and a critical examination of the records of other observers. Professor Day excludes the cases of recurrent nephritis and of infective nephritis with more or less obvious primary focal disease, and bases his observations on what may be regarded as war nephritis or trench nephritis proper. This he divides into two main groups—the common form characterised by breathlessness, œdema, and the urinary signs of acute nephritis, and a smaller group distinguished by hæmaturia and involvement of the lower urinary tract, which he follows Dr. R. G. Abercrombie in calling "lower tract cases."[2] Professor Day finds, in agreement with Dr. Abercrombie, that the onset of war nephritis is almost invariably associated with fever which may be of very short duration, so that the general course of the disease is in the main afebrile. He points out that pains in the limbs and back occur, often severe enough to keep the patient awake, and also observes that the spleen was enlarged in all of his cases, and that it became actually palpable in 50 per cent. of them. Professor Day was early impressed with the periodicity of some of the manifestations of the disease. He found that the daily output of urine increased at regular intervals or that it might show periodical falls with a temporary increase of the albuminuria or a visible return of hæmaturia. Such slight recurrences or relapses were often associated with a distinct febrile reaction lasting three days, with a change in the pulse-rate and a fall of blood pressure. Professor Day has observed in cases of trench fever a periodic variation in the enlargement of the spleen which occurs in that disease. He found that the spleen showed alternate advances and recessions in size at regular intervals of five or six days. In war nephritis he noted an exactly similar condition, the spleen varying in size with a periodic variation of identical character. The illustrative details of some of his cases were accompanied in the contribution to our columns with charts showing the variations in temperature, quantity of urine, and splenic enlargement, and his observations were summarised by claiming that the course of war nephritis is marked by more or less evident changes at regular intervals of five or six days—a feature which it shares with trench fever—and he asks whether war nephritis is a complication of trench fever. He admits that the actual proof or disproof of this hypothesis can only be settled by experimental and laboratory work. His reflections are of such interest that they should attract the attention of other observers to this question.

[1] THE LANCET, 1918, ii., 660.
[2] Journal of Royal Army Medical Corps, August, 1916.

THE MEDICAL PARLIAMENTARY COMMITTEE.

MEETINGS of the Executive Committee of the Medical Parliamentary Committee have taken place since our last issue, at which the work ahead was discussed. Coming into existence at so short a period before the General Election the Committee could not expect to play any prominent part in the election; but its offer to supply medical speakers to medical candidates has been welcomed in several directions. The fact that the Committee takes no cognisance of party distinctions will thus be made apparent on several platforms, and in this way the public will see that the Committee is standing for the principle that the medical profession should receive a full share of responsibility in the inception and administration of national health legislation, because the foundation of national progress is national health.

A NEW SIGN OF FOREIGN BODY IN THE TRACHEA OR BRONCHI.

IN the *American Journal of the Medical Sciences* for November Professor Chevalier Jackson has called attention to a new sign of foreign body in the trachea or bronchi which he terms the "asthmatoid wheeze." Further help in the diagnosis of such a body is desirable, for the usual methods—auscultation, percussion, and the X rays—though valuable when positive, do not allow the conclusion to be drawn that a foreign body is absent when they are negative. The new sign is called the "asthmatoid wheeze" because it is similar to the wheezing heard when the ear is placed close to the mouth of an asthmatic. The chief difference is that with the latter râles are more or less associated. In the case of the foreign body the sound is drier when typical, though it may be associated with the bubbling sounds arising from secretion. In a typical case the wheeze is much more marked after coughing out of all secretion than before. This is probably because secretion more or less occludes the spaces by which air escapes between the wall of the bronchus and the irregularly shaped foreign body. When cleared out more air passes and the wheezing is louder. Numerous cases of foreign body in the air passages are reported in which

sounds have been heard with the stethoscope or ear applied to the chest wall or over the cervical trachea or larynx, but the sounds emitted from the open mouth do not appear to have been studied. The nearest approach is the "croupy cough" mentioned as indicative of a foreign body in the larynx, but it is not in laryngeal cases that the "asthmatoid wheeze" is heard. If there is croupy cough the larynx must be looked at. But the indications for bronchoscopy are not so clear. The "asthmatoid wheeze" is elicited by placing the ear in front of the patient's open mouth while breathing deeply and regularly, and is heard during expiration. If wheezing is not noticed the patient is asked to carry respiration to the extreme limit, as though endeavouring to expel all residual air. In a number of cases the wheezing has been apparent only at the termination of this prolonged forced expiration. In others it was so loud as to be noticed all over the room. Care is necessary to distinguish between wheezing due to secretion and wheezing due to a foreign body. This cannot always be done with certainty. Moreover, secretion is usually present in the neighbourhood of a foreign body. As a rule the sounds of secretion disappear after cough and expectoration, while the wheeze of a foreign body remains after the most violent coughing unless the body has been shifted. Of 62 cases, in which the presence of a foreign body was proved, Professor Jackson found the wheeze in 41. It would not, of course, be produced by a smooth foreign body which corks a bronchus tightly.

THE MEDICAL DIRECTORY FOR 1919.

WE have received the Medical Directory for 1919 a few weeks earlier than last year, and take it as the harbinger of a return to more normal conditions in the publishing world. The number of names in the Directory is now 43,100, being an increase of 69 over last year, which itself showed an increase of 152 over 1917. The London total shows an increase of 30, while 119 fewer names are recorded in the provinces, the deficit being made up in Wales, Scotland, and Ireland. But these numbers have special sources of fallacy at the present time. It would have been easy to state the numbers of men and women respectively in the total list or in the respective sub-lists, and we are sorry that this has not been done. The number of women is commonly stated at between 1500 and 2000, which is only a rough approximation to the truth. The useful section summarising the principal laws affecting the medical profession has been brought up to date, and enumerates the drugs prohibited from sale to members of the Forces, with the recent additions of acetanilid and phenacetin. The Honours List in the Directory is no longer complete; the Order of the British Empire has been omitted altogether, as well as the Companions of the various Orders and the holders of the Victoria Cross, the Military Cross, and the Distinguished Service Cross. If the V.C. is not to count as a distinction worthy of record, it is a little difficult to see what is, but of course many holders of this distinction have not survived its bestowal. The high standard of accuracy we have been led to expect is maintained in this new edition.

THE House of the Royal Society of Medicine will be closed from Monday, Dec. 23rd, to Saturday, Dec. 28th, inclusive, but the Library will be opened to military medical officers except on Christmas Day and Boxing Day.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE time is approaching in the opinion of the Committee of Management of this Fund when a decision will have to be made as to the future of the Fund. The money in hand is nearly exhausted, and the war is over, but the needs remain, and what part, if any, the Fund can still play in meeting these needs must soon be determined.

Sir RICKMAN GODLEE, the Chairman of the Committee, has received the following letter from Dr. V. Pechère, the President of the Comité National de Secours et d'Alimentation, representing the Aide et Protection aux Médecins et Pharmaciens Belges Sinistrés; this is the representative Belgian Committee, sitting in Brussels, to which the mensualities of the Belgian Doctors' and Pharmacists' Relief Fund have been transmitted for distribution, while the *comptes rendus* of this Belgian body have been summarised frequently in our columns and those of our contemporaries, to show alike the receipt of our contributions and the manner of their allocation. Dr. Pechère writes:—

Bruxelles, Rue des Drapiers, 25.

MON CHER COLLÈGUE,—La guerre est virtuellement terminée. Le droit et la justice triomphent du mensonge et de la force brutale.

Les derniers soldats allemands quittent Bruxelles. Demain il n'y en aura plus un seul dans nos murs. On me dit que les communications postales sont rétablies entre la Belgique et l'Angleterre; et je trouve un ami qui part demain pour Ostende. Je saisis avec empressement cette occasion pour lui confier ces lignes qui, cette fois,—j'en ai l'espoir,—vous parviendront.

Elles iront vous dire en mon nom et au nom de mes collègues l'hommage ému de notre reconnaissance. Le moment n'est pas aux longs discours. Un mot résumera tous les sentiments dont nos cœurs débordent et dont, plus tard, nos lèvres essayeront de vous traduire l'expression. Ce mot, c'est: Merci!

La nation belge sait et n'oubliera jamais ce qu'elle doit à l'Angleterre et à ses alliés.

Les médecins et pharmaciens belges savent et n'oublieront jamais ce qu'ils doivent à leurs confrères anglais et à tous ceux qui ont contribué par leur générosité à soulager leurs misères.

Grâce à vous, grâce à eux nous avons pu sauvegarder la dignité morale de nos confrères nationaux, et les tirer d'une détresse matérielle que nos moyens professionnels eussent été impuissants à combattre.

Votre témoignage constant de solidarité corporative a été pour le corps médico-pharmaceutique belge un précieux et perpétuel réconfort.

Soyez en remerciés, tous, du plus profond de notre cœur. Nous vous adresserons sous peu un rapport complet sur l'activité de notre œuvre commune.

Croyez, mon cher collègue, à mes sentiments les meilleurs.

Vivent les Alliés! Rule Britannia! Vive la Belgique!

Votre dévoué,
DR. V. PECHÈRE.

Sir Rickman Godlee, Président du Belgian Doctors' and Pharmacists' Fund.

SUBSCRIPTIONS TO THE SECOND APPEAL.

The following subscriptions have been received up to Monday last, Dec. 9th:—

	£	s.	d.
Dr. H. O. Williams ...	2	2	0
Mr. S. Osborn	1	1	0
Dr. C. C. S. Watson ...	5	0	0
Woolwich and Lewisham Divn. B.M.A. (per Dr. C. J. Fuller, hon. sec.)	7	0	0
Sir Alfred Pearce Gould (monthly)	5	0	0
Ross and Cromarty Divn. B.M.A. (per Dr. E. Mackenzie, hon. sec.)	8	17	6
Mr. E. Boulanger	7	15	8
Royal Faculty of Physicians and Surgeons of Glasgow	26	5	0

Monthly Subscriptions.

The following monthly subscriptions have been received for November:—

	£	s.	d.
Dr. Vincent Tighe... ...	0	10	0
Dr. G. Grey Turner ...	1	1	0
Dr. W. E. Good	0	10	0
Dr. W. Luffman	0	10	0
Dr. A. K. Naish	0	10	0
Dr. J. O. Musson	0	10	0
Dr. T. W. Goodbody ...	1	0	0
Sir T. Barlow	0	10	0
Surg. P. G. S. Davis, R.N....	0	10	0
Dr. A. B. Stevens	1	0	0
Major E. R. Fothergill...	0	10	0
Dr. W. S. Hart	1	0	0
Dr. A. Graham	1	1	0
Dr. Hyla Greeves	0	10	0
Dr. H. Caiger	0	10	6
Dr. K. J. Dougall	0	10	0
Dr. A. W Forrest	1	0	0
Capt. H. L. P. Hulbert, R.A.M.C.	1	0	0
Dr. E. C. Morland... ...	0	10	6
Dr. H. Whitehouse ...	0	10	0
Dr. A. Hawkyard	0	10	0
Dr. W. Stewart	0	10	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W. 1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE King has sent a donation of £5 to the Queen's Hospital for Children, Hackney-road, E., for the Christmas Fund.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

—o—

SATURDAY, NOV. 30TH.

The Case of Frederick Charles Beaumont, L.D.S. R.C.S.

THIS case having been referred to the Dental Committee to ascertain the facts, the committee now reported that they had received shorthand notes of divorce proceedings, in which a decree nisi and absolute had been obtained, with Mr. Beaumont as co-respondent, the respondent having at one time been his patient. Mr. Beaumont also, they reported, gave evidence before them.

The Council deliberated *in camera* on the case, and the PRESIDENT then delivered its judgment, which was that Frederick Charles Beaumont had been adjudged guilty of conduct disgraceful in a professional respect, and that the Registrar was instructed to erase from the Register his name.

The Apothecaries' Hall of Ireland.

Sir JOHN MOORE presented the report by the Examination Committee on various matters relating to the Apothecaries' Hall of Ireland. The report ran as follows:—

On May 31st, 1918, the Council received and entered in its minutes a report by the Examination Committee, and adopted the following recommendations contained therein:—

"1. That the report of Dr. William Boxwell and Dr. Robert Rowlette on the examinations held from December, 1916, to November, 1917, be forwarded to the Apothecaries' Hall of Ireland for their information, with the request that they will favour the General Medical Council with any remarks they may desire to make thereon, in time for the meeting of the Council in November, 1918.

"2. That the Apothecaries' Hall be requested to continue to furnish the Tables of Exemptions from, and Results of, Examinations as heretofore, giving particulars of marks, and when the candidate had been previously examined by the Hall, and had passed some portion of the examination, the date of such examination."

These resolutions were conveyed to the Apothecaries' Hall of Ireland on June 5th, 1918.

On Nov. 11th the Apothecaries' Hall forwarded the following remarks on the report of Dr. William Boxwell and Dr. Robert Rowlette:—

"Apothecaries' Hall of Ireland, Mary-street, Dublin,
Nov. 11th, 1918.

The reports of Drs. Boxwell and Rowlette on the examinations held by this body have been considered by the Court of the Hall.

The Court desires to protest in the strongest possible manner against the continued reports and inspections on this institution.

The Court appoints examiners of the highest professional qualifications. Five are professors and one a lecturer in a recognised university; two are members of the Council of the Royal College of Surgeons, Ireland, while seven are members of leading clinical hospitals in Dublin. The Court therefore thinks that its Board of Examiners compares most favourably with any examining body in the United Kingdom, and considers that the perseverance of the General Medical Council in causing constant inspections to be made on the Hall to be due only to prejudice, and to be most unjust."

A Table of Exemptions from, and the Results of, the Examinations of the Hall, held in June, 1918, was received on Nov. 23rd, and is appended to this report. It calls for no comments.

On Oct. 28th, 1918, the Hall intimated that it would hold examinations, including the Final Examination, covering the period Nov. 11th to 25th, 1918, and this was communicated to Dr. Finny, who had been deputed to attend these examinations on behalf of the Council during the current year. Dr. Finny thereupon consulted the Council as to when he should present his report, and on the instructions of the President he was advised that it would be expedient to submit one annual report. This may therefore be expected to be ready for the consideration of the Council at the May session, 1919.

The following draft recommendations concluded the report:—

1. That the Apothecaries' Hall be requested to continue to furnish the Tables of Exemptions from, and Results of, Examinations as heretofore, giving particulars of marks, and when the candidate had been previously examined by the Hall, and had passed some portion of the examination, the date of such examination.

2. That the Irish Branch Council be authorised to appoint for the period of one year a deputy to attend and be present on behalf of the General Medical Council at the professional examinations held by the Apothecaries' Hall for the purpose set forth in Section 18 of the Medical Act, 1858; that the deputy so appointed present to the Council a report on the general character of such examinations; and that he be paid a salary of £50 for the year in question.

The report having been received,

Dr. MAGENNIS said that he thought that an injustice had been done in the report to the Apothecaries' Hall. For five years he had done what he could to render the examinations of that body what they should be. After a couple of years of effort he induced this Council to make certain recommendations, and every recommendation which had been made had been carried out by the Apothecaries' Hall. The examiners would compare favourably with those of any examining body in the Kingdom. The only real objections seemed to have been to clerical errors in the examination papers and to the fact that on occasion it was difficult to get some of the examiners there in time. He asked what were the reasons for the exceptional treatment meted out to the Apothecaries' Hall? The Council insisted on a deputy being appointed, but he knew the animus which actuated their deputies.

The PRESIDENT said that the reason for this method of dealing with the Apothecaries' Hall went back to the appeal made by that Hall to the Privy Council against the General Medical Council, in which it appeared that the Council had refused to appoint examiners in surgery in a certain case on the ground that the appointment of examiners in surgery in that case would not help the Council to determine whether the examinations in medicine and midwifery were conducted in a proper way. The Privy Council directed the General Medical Council to appoint examiners in surgery, pointing out that they had means of obtaining efficiency in the other examinations. Those means were the appointment of a deputy from the Council, and other persons had also been appointed to look after the other parts of the examination, not in the way of fault-finding, but in order to know what took place. The proceedings had been quite regular and carried out the terms of the Privy Council.

Sir ARTHUR CHANCE thought the Council ought to resent any imputations cast upon it.

Sir JOHN MOORE said the Council was bound to see that the whole conduct of the examinations was up to the standard considered necessary by them. At page 29 of the Interim Volume (1917) of the Transactions, Dr. Boxwell said: "On these and other grounds I think the examination in pathology, as conducted at the Apothecaries' Hall, is definitely below the standard required by any other licensing body I know of." Page 31 contained a summary of Dr. Boxwell's conclusions: "What strikes one most about the examinations, taken as a whole, is a certain inequality in the standard. The examination in pathology, for instance, is badly planned, although well carried out as far as it goes; whereas others are, through the peculiarities of examiners, sometimes rendered nugatory. I refer to the indulgence shown to outrageous blunders." If this report were adopted, it would be necessary to meet in London to appoint a deputy.

The report was adopted.

Appendix to Report by the Examination Committee, Apothecaries' Hall of Ireland, June, 1918.

No.	Preliminary Examination. When and where passed.	Primary.	Intermediate. Anatomy, Physiology.	Intermediate. Pathology, Medical Jurisprudence and Hygiene, Materia Medica.	Pharmacy.	A Medicine.	B Surgery.	C Midwifery.	Result.
B 25 ...	R.U.I., 1907.	A.H.I., 1909.	A.H.I., 1910.	A.H.I., December, 1915.	A.H.I., December, 1916.	A.H.I., June, 1918, 65%.	Not entered.	A.H.I., January, 1917.	P., A.
B 41 ...	R.U.I., 1900.	R.C.P. & S.I., 1901.	R.C.P. & S.I., 1903.	A.H.I., July, 1910.	A.H.I., July, 1910.	A.H.I., June, 1918, 81%.	A.H.I., June, 1918, 59%.	A.H.I., July, 1911.	P., A., & B.
B 59 ...	R.U.I., 1902.	R.C.P. & S. Ed., April, 1905.	A.H.I., October, 1912.	A.H.I., December, 1916.	—	Rejected in Clinical, June, 1918.	Rejected in Clinical. June, 1918.	Rejected. June, 1918, 33½%.	R., A. B. C.
C 44 ...	N.U.I., 1912.	N.U.I., 1914.	N.U.I., October, 1917.	A.H.I., March, 1918.	—	Not entered.	—	A.H.I., June, 1918, 60%.	P., C.

Report of the Education Committee on the Nature of the Recognition to be extended to the Schools Examinations recently established by the Board of Education.

The Report was presented by the Chairman of the Committee, Dr. J. Y. MACKAY. A general description of the purposes for which these examinations had been instituted by the Board of Education in England will be found in the Minutes of the Council, Vol. LIV., 1917. The Report thus defined the certificates issued by the Board of Education to the successful candidates according in each case to the educational level attained :—

(1) The certificate of success in the "Second" examination, which follows on a specialised course of study, bears the names of the subjects in which the candidate has passed, and is accepted *pro tanto* by the Universities in respect of the subjects they themselves recognise as satisfying their regulations for matriculation. Similarly it is accepted by the General Medical Council.

(2) That form of certificate of success in the "First" examination in which the candidate has obtained a "pass with credit" in certain of the subjects bears the names of the subjects passed with credit; and in respect of these subjects, should they be included in the University and Council Lists, it is accepted *pro tanto* by the Universities and by the General Medical Council. Candidates who have already obtained the School Certificate may, in subsequent examinations, enter for subjects in which they have not previously passed "with credit," and success in such subjects will be recorded on Supplementary Certificates.

(3) That form of certificate in the "First" examination issued to candidates who have not passed with credit in any of the subjects is termed an "ordinary pass." In it the names of the subjects actually passed are not detailed, but only the "groups" to which the subjects passed belong. As the "groups" referred to are of a very wide nature, and as the Council, like the Universities, has always required that certain subjects should be included, and has allowed only a limited selection in the case of others in its entrance examination, it is certain that it cannot under its present regulations, and could not, without a profound change in the methods hitherto followed, accept either the "ordinary pass certificate" ((3) above), or, in particular cases, the special certificates granted under the "pass with credit" or the "second examination" regulations ((2) and (1) above).

The Report set out the scope of the examination and the general view taken consistently by the Education Committee of the Council and recommended to the Council as follows :—

That the Council endorses the proposal contained in the Report—viz., that the certificate of the "First Schools' Examination" of the Education Board in England be accepted as affording sufficient evidence that the holder has fulfilled the educational conditions required of candidates for admission to its Register of Medical Students, provided that the subjects of English and Mathematics have been passed "with credit."

Dr. MACKAY, in presenting this report, said it was hoped in time to reach the higher standard which the Council had always had as its object. A very important step had recently been taken by the English Education Board in establishing "leaving certificates." In the absence of these latter, the schools had been preparing for a large number of external examinations, and the teaching had suffered greatly owing to the pressure exerted to meet the necessities of all those examinations. The result of having a general education examination would be to free the schools from this pressure. A similar arrangement had been operative in Scotland for a number of years, and he hoped to see such an arrangement in Ireland. The important matter in the future would be the mental training which the student had received, not his proficiency, as tested by examination, in any set subjects; and the Council had chosen the subjects best suited to that end. He proposed the adoption of the report.

Dr. NORMAN MOORE seconded.

The PRESIDENT congratulated the committee on the successful issue of their long negotiations with the English Education Board. The Council desired that a system of examinations should be established which would harmonise all the examinations throughout the country. The merit of the new scheme consisted in the fact that it was based on education, not on examination only, no inquiry being made as to the source of the information.

Dr. LANGLEY BROWNE asked whether there might not be some difficulty due to some of the schools not knowing how to work the scheme.

The PRESIDENT replied that many of the Universities would accept the certificate; the whole machinery became automatic.

The report was agreed to.

Report of the Pharmacopœia Committee.

This report, which was adopted, was as follows :—

The number of copies of the British Pharmacopœia, 1914, which were sold by the publishers between May 26th, 1918, and Nov. 23rd, 1918, was 1512. The number sold in the year ending Nov. 23rd, 1918, was therefore 2382. The total number sold since the date of publication is thus 31,736. Of the third issue of 5000 copies, about 3200 remain in stock.

The Committee are informed that the conditions governing the supply of glycerin, sugar, fats, and oils do not yet permit of the withdrawal of the notices respecting emergency "Alterations and Amendments" of the Pharmacopœia issued during the war.

The Ministry of Public Health.

The Council, sitting *in camera*, discussed the Bill to establish a Ministry of Health and a Board of Health to exercise in England and Wales and in Scotland respectively powers with respect to health and local government. (See THE LANCET, Nov. 16th, p. 685.)

On resuming after the sitting *in camera* the President announced that the Council had passed the following resolution :—

"The General Medical Council cordially supports the proposal to establish a Ministry of Health, and requests the Lord President to submit for its observation the draft of any future Bill on the subject. The Council hopes that any such measures may be applied in its general terms to all parts of the United Kingdom."

The report of the Students' Registration Committee on exceptional cases was also received, without discussion, on the proposition of Dr. NORMAN MOORE, seconded by Dr. KNOX.

Dental Education and Examination.

Mr. C. S. TOMES, in bringing forward the report of the Dental Committee, said that the Council had been approached by a number of embassies or ministries of foreign countries and by the representatives of the colonies asking the Council to make an important departure from previous practice. They had requested that the dental registers of these foreign countries and colonies be accepted *en bloc* by the Council; in other words, that an entry upon those registers should carry the right of entry upon the Foreign or Colonial List of the British Register. That course had never been followed by the Council, largely on the ground that admission to those registers might have been secured under various conditions; in fact, in one of the registers they had discovered 12 different grounds on any one of which people might get on to the Register. The Council had always taken the view that not a mere inscription upon a foreign or colonial register should qualify for admission to the British Register, but only that the courses of training and examination tests should be roughly equivalent to those obtaining in the United Kingdom. The Dental Committee now recommended the Council to keep to this practice and to refuse *en bloc* admissions. One reason that had influenced the Committee was that the Departmental Committee, recently appointed to consider the alleged shortage of qualified dentists, would shortly issue its report, and the present, therefore, was not an opportune moment for the Council to depart from any previous practice. He brought forward recommendations relating to Belgium and to Japan. The recommendation with regard to Belgian dentists was that a request for the Belgian Register to be recognised *en bloc* be not acceded to. This having been agreed to, he moved a further recommendation in the same terms with regard to the Japanese Register, with the addition, however, that the diplomas granted by the Nippon Dental College and the Tokyo Dental College be recognised as admitting to the Foreign List of the British Register. He said that the Tokyo College claimed 66 per cent. of the dental list of Japan, so that in recognising this they were recognising a material part of the Japanese Register.

Sir ARTHUR CHANCE seconded the recommendation, which was adopted.

Mr. TOMES brought forward a further recommendation that the request for the recognition *en bloc* of the New Zealand Register be not acceded to. This request was by the Deputy Director of Dental Services in the New Zealand Expeditionary Force, Major Rishworth, and had been forwarded through the Colonial Office. The Council already admitted one New Zealand diploma—the B.D.S., U. New Zealand degree—as qualifying for the British Register. It was stated, however, that this diploma only included 10 per cent. of the dentists of New Zealand. A letter setting forth reasons for not immediately granting the request had already been sent, but another answer, setting out very fully the reasons why this was not an opportune time for making the alterations suggested, would have to be sent later.

The recommendation was agreed to, as was a recommendation acceding to a request by one dentist to be admitted to the Foreign List on the ground that he entered the Dental College of the University of Michigan in 1891, obtained the D.D.S. Michigan in 1894, and had for 22 years

practised in Dublin. The degrees of the University of Michigan were recognised for registration here up to 1893, when recognition was suspended.

Mr. TOMES also stated that the British Dental Association had expressed its regret at the action of the Council at the May session in approving the scheme of the Birmingham Education Authority for the training and employment of dental nurses. The Representative Body of the Association believed that the approval had conveyed to the public the impression of some recognition of unqualified practice. The Council in giving its approval to the scheme had, of course, made it plain that such dental nurses must be thoroughly under the supervision of registered practitioners. The committee was unable to recommend the Council to make any alteration in its previous resolution.

The Council adopted a recommendation that every person whose name was entered for the first time in the Dentists Register should be entitled to receive a copy of the Register.

After votes of thanks to Dr. Norman Moore for ten years' assiduous service as Chairman of the Business Committee and to the President for his conduct of the chair the session closed.

URBAN VITAL STATISTICS.

(Week ended Dec. 7th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality was 28·6, against 36·3 and 36·5 per 1000 in the two preceding weeks. In London, with a population slightly exceeding 4,000,000 persons, the death-rate was 26·0, or 6·8 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 11·6 in Portsmouth, 12·7 in East Ham, and 12·8 in Enfield, to 53·4 in South Shields, 54·9 in Rochdale, 63·9 in Warrington, 65·6 in Nottingham, 70·5 in Walsall, and 91·6 in Sunderland. The principal epidemic diseases caused 154 deaths, which corresponded to an annual rate of 0·5 per 1000, and included 49 from infantile diarrhœa, 42 from diphtheria, 25 from whooping-cough, 19 from scarlet fever, 18 from measles, and 1 from enteric fever. Scarlet fever caused a death-rate of 1·2 in Birkenhead. The deaths from influenza numbered 3574, against 5119 in the previous week, and included 660 in London, 276 in Birmingham, 254 in Manchester, 172 in Sunderland, 162 in Nottingham, and 97 in Sheffield. The 1099 cases of scarlet fever and 1028 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 37 below and 14 above the respective numbers remaining at the end of the previous week. The causes of 79 deaths in the 96 towns were uncertified, of which 11 were registered in Birmingham, 9 in Liverpool, 6 each in Nottingham and Manchester, and 5 each in St. Helens and Sunderland.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 19·8, against 24·3 and 23·7 per 1000 in the two preceding weeks. Of the 911 deaths from all causes, 24 were classified to influenza, which was also stated as a secondary cause in 165 deaths classified to other diseases; in the previous week these numbers were 47 and 212 respectively. The 376 deaths in Glasgow corresponded to an annual rate of 17·6 per 1000, and included 7 from whooping-cough, 3 each from diphtheria and infantile diarrhœa, and 2 from enteric fever. The 131 deaths in Edinburgh were equal to a rate of 20·5 per 1000, and included 4 from whooping-cough and 1 from infantile diarrhœa.

Irish Towns.—The 172 deaths in Dublin corresponded to an annual rate of 22·5, or 3·5 per 1000 below that recorded in the previous week, and included 42 from influenza, 5 from infantile diarrhœa, and 1 from diphtheria. The 314 deaths in Belfast were equal to a rate of 41·7 per 1000, and included 3 from infantile diarrhœa, and 1 from scarlet fever.

UNRECORDED BIRTHS.—Writing to the Worthing corporation about the incomplete notification of births, the Local Government Board suggests that fathers should be prosecuted, and if this does not result in a considerable improvement in the proportion of births notified, proceedings should be taken against all persons liable—that is, father, doctor, and midwife.

NOTIFICATION OF INFLUENZA IN BELFAST.—At a specially summoned meeting of the Corporation of the City of Belfast, held on Dec. 7th, a resolution was passed unanimously ordering that the Infectious Disease (Notification) Act, 1889, should apply in Belfast for the disease known as "septic pneumonia" for the six months to end 14th June, 1919. In the discussion which took place it was stated that the drivers of the tram-cars (motor-men) had suffered from influenza in a larger proportion than conductors, although the latter were necessarily in closer contact with passengers in crowded cars than the former, who were standing out in the open air. Some of the speakers said it was all very well to make the disease notifiable, but how were they going to cure and to prevent it; others urged that the malady should be made permanently notifiable, but it was shown that it could be made notifiable at any time, subject to the approval of the Local Government Board, by giving fourteen days' notice through a resolution in the City Council.

The War and After.

THE CASUALTY LIST.

THE names of the following medical officers appear among the casualties announced since our last issue:—

Died of Wounds.

Capt. N. K. Foster, R.A.M.C., was educated at University College, London, and qualified in 1908. Prior to joining the R.A.M.C. he was in practice at Oxford.

Died.

Lieut.-Col. C. D. H. Corbett, Royal Air Force Medical Service, was educated at Oxford University and at St. Thomas's Hospital, London, and qualified in 1908. Prior to the war he was in practice in Welbeck-street, London, specialising in dermatology, and contributed many articles to medical literature. He died at Felixstowe of influenza.

Capt. W. R. O'Keefe, R.A.M.C., qualified in Ireland in 1912, and prior to joining the R.A.M.C. was in practice in Sheffield.

Capt. W. H. Compton, R.A.M.C., was a student at Charing Cross Hospital, London, and qualified in 1886. He held appointments as medical referee to several assurance companies, and was at one time a surgeon to the Royal West Indian Mail Steam Packet Co. He died of pneumonia.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Second Lieut. A. B. Beesley, R.A.F., died of pneumonia, second son of Dr. C. Beesley, of Exmouth.

Capt. D. N. Carr, S. Persian Rifles, died in Persia of pneumonia, only son of Dr. D. W. Carr, of the Church Missionary Society, Ispahan.

Able Seaman G. M. Davis, *Benbow* Battalion, R.N.D., died in Holland of septic pneumonia, second son of Temp. Capt. G. W. Davis, R.A.M.C., of Sidcup, Kent.

Second Lieut. F. Sansom, killed in a bombing raid over Germany, third son of Dr. C. L. Sansom, C.M.G., of Kuala Lumpur, F.M.S.

Capt. W. R. Bruce-Clarke, R.A.F., died of pneumonia following influenza, only son of the late Mr. W. Bruce-Clarke, of Harley-street, London, W.

OBITUARY OF THE WAR.

PATRICK JOSEPH O'REILLY, L. & L.M. R.C.P. & S. IREL.,
MILITARY CROSS,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain P. J. O'Reilly, who was killed in action in France on Oct. 11th, was eldest son of the late John O'Reilly, J.P., of Strabane, Ireland. Educated at St. Columb's College, Londonderry, where he was distinguished in the playing fields, at Black Rock College, and at the Royal College of Surgeons in Ireland, he qualified in 1914, and was appointed ship's surgeon on the Blue Funnel Line. Arriving home from China at the beginning of October, 1914, he obtained a commission in the R.A.M.C. and went to France with his regiment, the 9th Devons. In the fighting around Hulluch in September, 1915, he was wounded in the leg, and later gained the Military Cross for conspicuous bravery and devotion to duty, remaining at his post although himself wounded. In May last he was badly gassed, losing his sight completely for several weeks. He met his death whilst tending the wounded. Captain O'Reilly married in 1916 Sybil Olive, daughter of John Collins, of Romsey, Hants. The photograph which we give of him has been enlarged from a snapshot.

THOMAS RICHARD BEALE-BROWNE, M.R.C.S. ENG.,

WEST AFRICAN MEDICAL SERVICE.

Mr. Beale-Browne, who was drowned by the collision of the *Buruta* with the *City of Calcutta* within a few hours of reaching port on Oct. 3rd, at the age of 40 years, was the eldest son of Colonel Beale-Browne, of Andoversford. Educated at Dean Close School, Cheltenham, he proceeded to Guy's Hospital, where he qualified in 1901. He was a keen athlete, taking prizes for running in the Inter-Hospital Sports. Afterwards he made his mark in rifle-shooting, taking prizes at meetings of the Society of Miniature Clubs and at Lagos. After a few years spent in lunacy work at Taunton and the County Asylum, Northampton, he entered the W.A.M.S. On his first tour in 1907–08 he accompanied the Anglo-German Boundary Commission, and afterwards did good work as medical officer in various districts of West Africa. While stationed at Yaba he carried out research work on leprosy. In several cases he noted improvement as the result of his treatment, and in one case apparent cure, but he never afterwards had an opportunity of continuing this work.

Mr. Beale-Browne was a man who put his whole heart into his work, and had the trust and respect of all who came in contact with him. At the time of his death he was homeward bound from the Cameroons, where he had done duty for 21 months. He married in 1910 Helen H. Hay, daughter of the late Donald MacDonald, of Edinburgh, who survives him.

LAWSON TAIT McCLINTOCK, M.B., CH.B. EDIN.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain L. T. McClintock, who died on Nov. 11th at the age of 39 years, was younger son of the late Dr. J. R. McClintock, of Church Stretton. Educated at Shrewsbury and Edinburgh University, he took the M.B., Ch.B. degrees in 1901, and after qualifying filled the post of assistant house surgeon at Salop Infirmary. Settling in Loddon in 1902, he was appointed medical officer to the rural district council and later to the Loddon and Clavering union. At the outbreak of the war he organised the Red Cross Hospital at Loddon and held the post of medical officer there, as well as at the Red Cross Hospital at Hedenham. In 1917 he was appointed medical officer to the 342nd Brigade, R.F.A., and was gazetted captain in the R. A. M. C. in 1918. His death was caused by pneumonia following upon an attack of influenza.

Captain McClintock lived a very active life, took a keen interest in local affairs, and his early death is felt as a calamity. He married in 1903 a daughter of the Rev. S. Irvine, of Londonderry, and leaves a widow and four children.

Correspondence.

"Audi alteram partem."

PHTHISIS IN FACTORY AND WORKSHOP.

To the Editor of THE LANCET.

SIR,—In his interesting article on the prevalence of pulmonary phthisis in relation to industrial conditions (THE LANCET, Nov. 9th) Professor Benjamin Moore affirms the two main factors to be: long-continued working strain and case-to-case infection in unhealthy workshops. I should like to ask Professor Moore, What about the wives of these tuberculous men? Are they not in more unhealthy conditions in their homes? Are not these homes even more ill-ventilated, ill-cleaned, ill-illuminated than the workshops? Are the women not just as much over-strained by domestic work? Moreover, if tubercle bacilli can infect the workmen at a range of 2 or 3 feet in the workshop, surely the same bacilli must be twenty times more infective to the wife of the tuberculous man at point-blank range?

The cause of the different incidence as between men and women must, in fact, be looked for elsewhere, in what French pathologists have long called the *terrain*. It is the individual resistance that counts. Professor Moore records the fact, observed by my friend Dr. Ed. Bertholet, of Lausanne, that up to the age of 25 years more females than males die of tuberculosis. Dr. Bertholet adds that these deaths are largely of abstainers and suggests hereditary tuberculosis as the cause. After 25 years of age more men than women die of tuberculosis, or, as Dr. Bertholet puts it, more drinkers than abstainers. Professor Landouzy said long ago, "L'alcool fait le lit de la tuberculose." Professor Moore has made observations on the printing trade, in which, as Dr. W. C. Sullivan has set out, the average conditions of employment promote industrial alcoholism. No doubt the alcoholic atmosphere of the metropolis contributes to this result. On the other hand, in the country men are scarcely more infected than women. This is in accord with the different conditions of rural life in that (1) the men are seldom exposed to infection and (equally with the town areas) not more than their wives; (2) they lead a healthy outdoor life; (3) they are occasional, not regular, drinkers. Thus the essential cause of adult tuberculosis—alcoholism—is lacking in the case of the rural male. Pathologists tell us that 93 per cent. of the hospital population show at death signs of tuberculous lesions in the lungs, active or healed. This means that practically everyone in poorer urban areas has been exposed to tuberculous infection, but probably at least three-fourths of these infections heal without giving rise to much disturbance of health; only the chronic drinker and the predisposed develop severe disease.

True we must, with Professor Moore, try to stop the contagion in the workshops. But we must at the same time tell the workmen this is only one part of the scheme, and the worker's part is to put an end to the chronic alcoholism.

I am, Sir, yours faithfully,

M. F. BOULENGER,
Ex-Assistant Medical Officer of the Tuberculosis Dispensary "Albert Elizabeth" of Brussels; Assistant Medical Officer, Darenth Industrial Colony.

Dartford, Kent, Dec. 6th, 1918.

THE AMBULANCE DEPARTMENT OF THE ST. JOHN AMBULANCE ASSOCIATION.

To the Editor of THE LANCET.

SIR,—I notice that your reference to "First Aid in Ordinary Life" in your issue of Nov. 30th has been followed by a letter from Sir Rickman J. Godlee and Sir James Cantlie, K.B.E., a Knight of Grace of the Order of St. John.

I feel I must call attention to the fact that the St. John Ambulance Association is the pioneer of voluntary ambulance work, having been formed so long ago as 1877. This fact is, however, already well known, and I wish to refer more particularly to the need for maintaining or acquiring a knowledge of first aid. As Sir Rickman Godlee says, you rightly emphasise its importance, but he is inclined to think that with the advent of peace there will be a falling off in the attendance at classes of instruction. This ought not to be the case, especially if the public can be made to realise

that with the advent of peace their responsibilities are increased owing to the return of so many maimed and crippled prisoners and those utterly wasted and permanently ruined in health.

It will be our duty to attend to the wants of all such persons, and the importance of possessing a knowledge of first aid cannot be exaggerated or too often brought before the public. I am, Sir, yours faithfully,

RANFURLY,
St. John's Gate, London, E.C. 1, Dec. 11th, 1918. Director.

*** Nothing was further from our desire than to belittle in any way the St. John Ambulance Association, whose service has been regularly noticed in these columns.—ED. L.

THE ABDERHALDEN REACTION.

To the Editor of THE LANCET.

SIR,—In THE LANCET of Nov. 2nd there is an annotation dealing with Dr. J. M. Retinger's investigations on the detection of organic brain tumours by means of the Abderhalden's dialysis method, and the conclusion is reached that "in some hands, at any rate, the method may come to possess a more than academic value." In THE LANCET of Jan. 16th, 1915, I published the results of my clinical investigations based on the methods of Abderhalden. On a series of tests conducted with both the dialysis and the polariscope methods I came to the conclusion that in pregnancy, as well as in cases of malignant disease and many other morbid conditions, proteolytic and peptolytic ferments are present in the blood serum which cannot be demonstrated in the blood of a healthy person. On the other hand, I was unable to find the *specific* ferments claimed by Abderhalden and many of his followers.

Were it actually possible to demonstrate the presence of specific ferments in the blood serum the Abderhalden test would have to be considered as the greatest and the most useful discovery ever made in the domain of medical science. It would only require to devise a routine laboratory test for the purpose of establishing a diagnosis of any diseased condition. Nearly four years have passed since I published my results, and still we do not see this test introduced as a routine examination in the clinical laboratories all over the world. How is it to be explained? The complicated technique is certainly not at fault. No doubt a certain skill is required, but nothing beyond the power of an average laboratory worker. The explanation, I think, is a different one. The test is not generally applied, because it is *of no use for clinical purposes*. It is, in fact, not a clinical test at all. The whole history of the Abderhalden discovery is that of a great scientist who comes out prematurely with a statement, sticks to it, tries to find more and more proofs for its authenticity, and by his personal influence induces many others to repeat his assertions. Over 300 separate investigations were published before I communicated the results of my own work, the great majority confirming Abderhalden's results. Only a few recorded results differ from those of Abderhalden. But in this case time has amply proved that these few and not the majority of workers were right.

I am, Sir, yours faithfully,

Cambridge-terrace, Regent's Park, N.W., J. O. GAVRONSKY.
Dec. 9th, 1918.

ADVANCES IN THE TREATMENT OF FRACTURES.

To the Editor of THE LANCET.

SIR,—Not long ago I had the opportunity of seeing something of the work being done at No. 8 Stationary Hospital, Wimereux, under the surgical charge of Major M. Sinclair, R.A.M.C. I had already had the advantage of learning a little about the sound principles which govern his practice in the treatment of fractures, simple and compound, and of the ingenious methods and mechanical aids which he has elaborated for the management of the most difficult of such cases, for Major Sinclair visited the Queen Alexandra Military Hospital and at the Census Hospital, at which I was then surgical specialist, gave several admirable and instructive demonstrations of his particular technique and apparatus. These methods and their results may be seen on a large scale in No. 8 Hospital, and I can strongly advise anyone concerned with the management of bad fractures to go there, where he will be well repaid by what he can learn. I suppose one is not very far from strict accuracy if one admits that the Thomas splint has been the greatest mechanical non-operative advance in the treatment of fractures which any one man has added to our surgical equipment, and above all to military surgery, where bad cases have to be moved over long distances. But I think I may fairly add to this glorification of the Thomas splint that the clever and practical adaptations of it to the many varied forms of smashed limb in the hands of Major Sinclair, as well as his own particular uses of glue, suitably contrived foot-pieces, and his various methods of extension of limb and retention of fragments in position, make up a contribution to the surgery of the war which is unique and of distinguished excellence. The work of this officer has, in my judgment, diminished suffering, shortened treatment, saved money, and often life itself, and all this perhaps to a greater extent than has been attained by the labours of any one man in the more purely technical branch of our art. I confess myself deeply in his debt for what he has taught in these matters, and on the eve of my return to Australia I feel myself constrained to write this letter of appreciation in the hope that it may impel others to go and see for themselves how great have been the advances in a branch of difficult surgery which we owe largely to Major Sinclair's originality and patient industry.—I am, Sir, yours faithfully,

R. SCOT SKIRVING,
Honorary Major, Australian Army Medical Corps; late Surgical Specialist to the Census Division, Queen Alexandra Military Hospital, Millbank.
London, Dec. 7th, 1918.

DISPENSARY SUPERVISION IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I agree with Dr. G. Jessel (THE LANCET, Oct. 26th) that dispensary treatment is the most economical and best method of treating early non-infective pulmonary tuberculosis. My contention, which Dr. Jessel criticises, was that once tubercle bacilli appear in the sputum dispensary and domiciliary treatment, as understood by the Tuberculosis Regulations, are a danger to the community, and very potent causes in maintaining the high incidence-rate of this disease. Dr. Jessel's first paragraph, in which he admits that close supervision is rarely exercised and that the discipline necessary is irksome, spoils his subsequent arguments. The figures he gives of the number of visits paid by his nurses are not impressive. An average of less than five visits a year per patient cannot be called close supervision. In Southampton during 1916 the tuberculosis nurses paid 4008 visits to 274 cases under treatment, whilst in 1917 5171 visits were paid to 315 cases under treatment. The majority of these cases also attended the dispensary twice a week for treatment. These figures improve upon those given by Dr. Jessel, and yet the results observed have totally failed to convince me that in advanced cases this mode of treatment is satisfactory.

Tuberculosis is essentially a house and factory disease, and is spread by unsatisfactory housing and factory conditions. The housing conditions in a town, particularly among the class of people reached by the Insurance Act, are eminently unsuitable for the treatment of an infectious disease. From Dr. Jessel's figures for 1917—his best year—it appears that 29 per cent. of 1615 patients had unsatisfactory bedroom facilities. I should like to know how many of these had tubercle bacilli in the sputum. He states: "In 1917 complete isolation was obtained in over 70 per cent. of 1615 cases of phthisis." Dr. Jessel's optimism is sublime. Did his 70 per cent. of cases stay rigidly in bed in one room without communication with the outside world? Surely, the period of sleep is the least infective time. Does he imagine that *complete* isolation is ever carried out in a private house, or that even fragmentary isolation is possible in 80 per cent. of the houses of the poorer working classes? Again, Dr. Jessel believes that a visit by the tuberculosis officer once in three months (I presume the patient is notified of the visit beforehand), and five times a year by tuberculosis nurses, will prevent infringements of the "discipline which is admittedly irksome." From past sanatorium experience I am unable to support this opinion.

The vast majority of private practitioners, I fear, think differently from Dr. Jessel. In Southampton this matter was brought before a meeting of medical practitioners

From their own observations and from my statements they were so impressed with the dangers of domiciliary treatment that they drew up a resolution to bring the matter before the health committee of the borough. The opinion of the patient "man-in-the-street" is also, I fancy, opposed to the keeping of foci of infection at large in the community. It is easier to limit opportunities for infection than to cure poverty. At a time when extra nourishment and help are most needed by these patients the State fails them. It is difficult to keep up an irksome discipline upon an empty stomach. The observations of Professor Bang upon the elimination of tuberculosis in herds of cattle by the simple expedient of keeping unaffected animals strictly separate from infected ones bear upon the subject under discussion. What is successful in cattle would, if carried out thoroughly, be equally successful in human beings. The segregation of the "open" cases of pulmonary tuberculosis is necessary if this disease is to be stamped out.

In the last report of the Medical Officer to the Local Government Board much support for this view can be found. The report says: "In pulmonary tuberculosis there may be a latent period stretching over years, and cause and effect may be difficult or impossible to connect." This I plead as justification for the present deficiencies in my figures to which Dr. Jessel takes exception.—I am, Sir, yours faithfully,

OSCAR HOLDEN,
Tuberculosis Medical Officer.

Southampton, Dec. 3rd, 1918.

THE LONDON UNIVERSITY ELECTION: A PROTEST.

To the Editor of THE LANCET.

SIR,—I find that Sir R. Douglas Powell, Dr. Sidney Phillips, and Mr. Eccles have circulated a post-card on which they state that "the chance of returning a medical candidate, who is not a graduate of our University, is very remote." As I am the only medical candidate the statement is that my chance is very remote.

That is not political manners. You may say of your opponent that he will ruin the country or that he has ruined his grandmother. But as regards the election itself you treat him with courtesy and suppose that you meet on equal terms. You don't adopt the boastful manners of Homeric heroes or Goliath of Gath before the fight begins. From that point of view it is an impertinence. From another it comes very near to being a lie, for they state as a fact what they cannot possibly know to be true, and the statement is, as far as I can tell, quite unwarranted. I am not relying on medical votes alone. All of us, I suppose, draw our support, at least I know I do, from all faculties. The medical vote alone is not large enough to return a candidate, but if I get a fair share of it I shall, as far as I can see, stand a very good chance. At any rate, I am quite sure they don't know the contrary, and they've no business to state it as if they did. Four days ago I was told by an elector, and an experienced elector too, that Sir Philip Magnus would be at the bottom of the poll, and, upon my word, when I see his committee reduced to such tricks I begin to believe they think so too. The statement has just as much foundation as their own. The truth is that in a constituency like this no one knows what anyone else's chances are. He only knows the cards he holds himself. If there is not a medical member for the University it will be due chiefly to these three medical men.

And why in the world should they single me out for an attack of this kind, who am of their own profession, and a colleague? Why don't they say that Mr. Somerville's or Mr. Nordon's chances are very remote? They know just as little about them as they know about mine and have just as much ground for the statement. But they have no right to say it of anyone, and they ought to be ashamed of themselves. That comes of party.—I am, Sir, yours faithfully,

W. P. HERRINGHAM.

Dec. 8th, 1918.

[ENCLOSURE.]

University of London.—Parliamentary Election.

It is most important at the present crisis not to divide the Coalition vote. The chance of returning a medical candidate, who is not a graduate of our University, is very remote.

It is certain that every vote not given to Sir Philip Magnus may have the effect of helping to secure the return of the Labour-Socialist candidate.

R. DOUGLAS POWELL, M.D.
SIDNEY P. PHILLIPS, M.D.
W. MCADAM ECCLES, M.B., M.S.

44, Lancaster Gate, W.2.
Dec. 3, 1918.

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THE ELECTION FOR THE SCOTTISH UNIVERSITIES:

THE ACTION OF THE MEDICAL PARLIAMENTARY COMMITTEE.

To the Editor of THE LANCET.

SIR,—We understand that the supporters of Professor W. R. Smith's candidature for the Scottish Universities are stating that Professor Smith was adopted by this Committee as a suitable representative for the constituency.

This is an erroneous reading of the action of the Committee, which has adopted no candidate for any particular constituency. A list has been made of medical candidates for the election now upon us, and these medical men have been approved for Parliament by the Committee in discharge of the responsibility laid upon it by the general meeting of the medical profession at which the Committee was formed. Yours faithfully,

ARTHUR LATHAM,
CHAS. BUTTAR,
Honorary Secretaries, the Medical Parliamentary Committee.

Medical Parliamentary Committee, 20, Hanover-square, London, W. 1, Dec. 10th, 1918.

AGGLUTINATING PROPERTIES OF CERTAIN SERA: A CORRECTION.

To the Editor of THE LANCET.

SIR,—With reference to my paper on this subject which appeared in THE LANCET of Nov. 9th I stated that the strength of *B. paratyphosus A* and *B* were each only half that of *B. typhosus* in T.A.B. vaccine. Lieutenant-Colonel D. Harvey, Royal Army Medical College, has written to me pointing out that the strength of the Army vaccine has been increased since February, 1916, to the following—viz., 1000 million *B. typhosus* and 750 million of each *B. paratyphosus A* and *B*. I am, Sir, yours faithfully,

THOMAS T. O'FARRELL.

University College, Dublin, Dec. 9th, 1918.

THE PENAL POWERS OF THE GENERAL MEDICAL COUNCIL.

To the Editor of THE LANCET.

SIR,—From the peculiar source of its authority the General Medical Council is inclined to pay undue deference to charges brought before it by public bodies, and more especially by Government Departments. From my own long experience of the working of the General Medical Council I feel justified in making this serious statement. The recent case of Dr. Flament, in my opinion, condemns the General Medical Council as unsuited for the judicial functions it exercises. I am not going to say whether Dr. Flament is, or is not, guilty of the offence of which the Council found him guilty; I do not know, and neither does the General Medical Council. But surely he was entitled to be judged fairly according to the evidence laid before the Council. The Council found him guilty of either attempting criminal abortion or of obtaining money by false pretences; there was no other conceivable charge before the Council. I will not dwell on the nature of the evidence or the strange way in which it was got up, beyond mentioning that the witness, on whose statement the charge depended, admitted the criminal offence of inciting Dr. Flament to procure abortion, and that the only corroborating evidence—that of her sister—was not very consistent with the evidence she gave. I challenge contradiction when I say that no competent and honest judge could have found Dr. Flament guilty on the evidence laid before the Council in my presence, evidence on which the General Medical Council did, in fact, find him guilty. But, Sir, the Ministry of Munitions was the prosecutor, and consequently the regulations of the General Medical Council as to statutory declarations, and other safeguards properly required by a judicial body with no power to administer an oath, were not insisted on. An adjournment, to give Dr. Flament some chance to disprove the charge suddenly sprung upon him, could not be allowed. It would have inconvenienced a Government Department. Does the medical profession approve? I am, Sir, yours faithfully,

CUSTOS CUSTODUM.

Dec. 9th, 1918.

THE SERVICES.

IT has been announced that Col. A. Webb, A.M.S., will succeed the Director of Medical Services in the Ministry of Pensions, in view of the treatment by the Army Medical Service of pensioners and disabled soldiers. The information is incorrect.

ROYAL ARMY MEDICAL CORPS.

Temp. Lieut.-Col Sir Hugh M. Rigby (Brevet Lieut.-Col., R.A.M.C., T.F.) to be temporary Colonel whilst specially employed.

The undermentioned relinquish the acting rank of Lieutenant-Colonel on re-posting: Major J. T. McEntire, Capt. S. J. Higgins.

To be acting Lieutenant-Colonels: Temp. Capt. (acting Major) H. K. Wallace, Major and Brevet Lieut.-Col. D. S. Skelton (whilst specially employed), Major J. W. L. Scott and Major A. W. Sampey (whilst in command of a Medical Unit).

Major E. G. R. Lithgow is seconded for service with R.A.F.

Temp. Capt. H. M. Grey to be acting Major whilst specially employed.

P. S. Clark to be temporary Major.

To be acting Majors: Capt. W. P. Croker; Temp. Capts. D. O. Riddel, W. Mason, C. H. Haddow, J. M. Moyes, A. Fullerton, T. L. Hardy, A. Leeming, F. K. Kerr, J. J. Gibb, H. L. Neil, C. E. Sundell, W. S. Stevenson, C. F. White.

Temporary Lieutenants to be temporary Captains: A. Leitch, J. Ramsbottom, R. J. Wilson, N. F. Sinclair.

To be temporary Captains: G. Muir, G. W. Thompson, E. D. Townroe (late temporary Captain, Vol. Bn., E. Surr. R.), S. Barron, W. D. Sammon, C. J. A. Woodside, H. G. P. Armitage, E. W. Diggett, A. R. Barlas, H. S. Campion, T. B. H. Tabuteau, J. L. Annan, F. Joyce, R. J. MacMillan, J. M. Taylor, A. W. M. Sutherland, J. Devine.

E. W. Lynch, late temporary Captain, is granted the honorary rank of Captain.

Temporary Captains G. D. Laing and R. S. Scott relinquish the acting rank of Major on re-posting.

To be temporary Lieutenants: C. H. C. Cosens, A. Bevan, C. A. Basker, J. N. Turnbull, W. G. Cook, J. B. Michie, T. M. Walker, W. L. Hogan, C. E. Pengelly, A. Bisset.

A. B. Pastel to be temporary honorary Lieutenant.

Officers relinquishing their commissions: Temp. Capts. E. A. Sanders, A. Leitch, M. J. Casserly, R. C. Smith, H. E. Bloxsome, W. Dalgliesh, C. M. Stevenson, J. N. McTurk, G. L. Brunton, H. C. Halsted (on ceasing to be employed at the County of Middlesex War Hospital), R. L. Hutton, J. A. O'Regan, E. S. Hawthorne, H. Galloway, W. Ainslie, H. D. Pollard, G. E. Lockyer, M. Coghlan (on account of ill-health, and is granted the honorary rank of Captain), J. J. Sinclair (on account of ill-health, and is granted the honorary rank of Captain), A. A. Hall, Temp. Hon. Capt. J. Boyd (on ceasing to be employed with Welsh Hospital, Netley); Temp. Lieuts. A. G. Tolputt, N. C. Fischer, A. M. McCormick, B. F. Howlett, I. Clarke, J. J. Pickles, G. A. Valentine; Temp. Hon. Lieuts. L. W. Darrah, V. S. Laurin.

SPECIAL RESERVE OF OFFICERS.

Capt. H. R. Friedlander relinquishes the acting rank of Major on re-posting.

A. J. Clark, late Captain, is granted the honorary rank of Captain.

Lieut. B. W. F. Armitage, from Unattached List (T.F.), to be Lieutenant.

To be Lieutenants: R. S. Davies, P. G. Quinton, and C. G. Coombs (from University of London Contingent, O.T.C.), W. Young, H. Wands, J. P. Kiltv, A. S. Strachan, J. S. McL. Gray, and R. P. Smith (from Glasgow University Contingent, O.T.C.), F. Lyth (from Manchester University Contingent, O.T.C.), A. P. McLeod.

TERRITORIAL FORCE.

1st Eastern General Hospital: Officers to be acting Majors whilst specially employed: Capts. J. C. W. Graham and G. S. Haynes.

2nd London Sanitary Section: Lieut A. W. Allison relinquishes his commission on account of ill-health contracted on active service, and is granted the honorary rank of Lieutenant.

1st Scottish General Hospital: Capt. H. E. Smith to be acting Major whilst specially employed, and to remain seconded.

4th London General Hospital: Major (temp. Lieut.-Col.) G. N. Biggs relinquishes his temporary rank, and is now seconded for duty with R.A.F.

4th Northern General Hospital: Capt. (acting Major) H. J. Smith relinquishes his acting rank on ceasing to be specially employed, and remains seconded.

4th Scottish General Hospital: Capt. J. R. Riddell to be acting Major whilst specially employed.

General List.—Capts. (acting Majors) H. H. Robinson and D. H. Scott relinquish their acting rank on ceasing to be employed.

Capt. R. A. Stark to be acting Major while specially employed.

Lieut.-Col. F. E. Fremantle, from Sanitary Service, to be Lieutenant-Colonel.

Majors H. E. Corbin and A. H. Hogarth, from Sanitary Service, to be Majors.

Major (temp. Lieut.-Col.) A. Greenwood, from Sanitary Service, to be Major, and to relinquish his temporary rank.

Major W. E. Miles to be acting Lieutenant-Colonel while specially employed.

Lieut.-Col. C. E. Humphreys, from Sanitary Service, to be Lieutenant-Colonel.

Capt. R. Briercliffe, from Sanitary Service, to be Captain, with precedence.

Capt. (acting Major) J. Dale, from Sanitary Service, to be Captain, and to retain his acting rank.

Capt. (acting Major) S. R. Gibbs to be Major.

Capts. A. W. Hayward and H. J. A. Longmore to be acting Majors whilst specially employed.

TERRITORIAL FORCE RESERVE.

Major H. L. de Legh, from Attached to Units other than Medical nits, to be Major.

ROYAL AIR FORCE.

Medical Branch.—R. C. Fuller, C. Dickson (late temporary Captain, R.A.M.C.), and J. P. Doyle are granted temporary commissions as Captains.

D. C. Farquharson and P. J. Herlihy are granted temporary commissions as Lieutenants.

Dental Branch.—R. N. Hillier is granted a temporary commission as Lieutenant.

OVERSEA FORCES.

South African Medical Corps.—The undermentioned relinquish their commissions: Lieut.-Col. W. B. Skinner, Major W. H. Marwell, Temp. Major A. Liebaert, Capts. K. Bremer, W. Shanks, C. T. D. Urquhart, D. Melville, J. M. Macdonald. Temp. Capts. P. A. Green, T. J. W. A. Johnston, J. B. K. Tough; Dental Surgeons: Lieut. W. S. Murdock, Major C. M. Brothers.

To be temporary Captains: A. J. McClymont, H. B. Maxwell, M. Schwartz, E. B. Wooliff, L. G. Irvine, J. Harpur, R. Stevenson, W. M. Tough, W. H. Hunter, D. McCully; Dental Surgeons: C. E. Rice, J. Figlor.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—At a meeting of the Royal College of Physicians of Edinburgh, held within the Physicians' Hall on Dec. 5th, Sir Robert Philip was elected President of the College. The following Fellows were appointed to form, along with the President, the Council of the College for the ensuing year, viz.:—Dr. A. H. Freeland Barbour (Vice-President), Dr. T. J. Thyne, Dr. Francis D. Boyd, Dr. G. M. Robertson, Dr. Harry Rainy, Professor J. Lorrain Smith.

ROYAL STATISTICAL SOCIETY.—On Tuesday next, Dec. 17th, Dr. John Brownlee will read a paper on the Biology of a Life Table, 5.15 P.M., at 9, Adelphi-terrace, London, W.C.

LITERARY INTELLIGENCE.—William Heinemann (Medical Books), Limited, will shortly publish a work on "Pensions and the Principles of their Evaluation," by Dr. Ll. J. Llewellyn and Dr. A. Bassett Jones. Translations of the work into both French and Italian are being arranged.

ROYAL ALBERT HOSPITAL, DEVONPORT.—The annual meeting was recently held under the presidency of Vice-Admiral Sir C. F. Thursby. The medical report was satisfactory, and the financial statement showed a credit balance of £331. It is gratifying to see that the financial position of this institution has been greatly improved.

A SERVICE in memory of the authors, men and women, who have laid down their lives in the war will be held in All Saints' Church, Ennismore-gardens, S.W., on Saturday, Dec. 21st, at 3 P.M. The service will be conducted by Canon A. C. Deane, Vicar of All Saints', and chairman of the Incorporated Society of Authors, Playwrights, and Composers. In view of the arrangements for seating, it will be a kindness if those who intend to be present will notify Mr. G. Herbert Thring, Society of Authors, 1, Central Buildings, Tothill-street, S.W.1.

A SPECIALIST'S VISIT TO A MENTAL PATIENT IN AN ASYLUM.—A Divisional Court of the King's Bench has granted a rule against the Commissioners of Lunacy in these circumstances. The brother of a certified patient at a lunatic asylum having desired that the patient should be visited by Dr. Lionel Weatherly as a specialist, the superintendent of the asylum replied that such a visit would be unprecedented. The request, being repeated through the medium of a solicitor, was granted, but neither the superintendent nor the medical man in charge of the patient met Dr. Weatherly, and the case-book and certificate were not produced to him. The visit having proved fruitless, a request for a further visit was made to the Commissioners of Lunacy. This having been refused, an application in the King's Bench for a mandamus followed. A rule was granted against the Commissioners.

DEATH OF CHARLES MAUDE RICHARDS, L.R.C.P. & S.I.—The death is announced of Mr. C. M. Richards, which occurred suddenly on Dec. 4th, at his residence in Cookstown, co. Tyrone. The eldest son of the late Canon Lewis Richards, D.D., Dungannon, and nephew of the late General Maude, Mr. Richards (who obtained the L.R.C.P. & S. Irel. in 1892) was, after qualifying, for a time medical officer in the well-known Bibby Line, plying between Liverpool and Rangoon, and in the British India Steamship Company. Subsequently he began practice in Cookstown, where, as a most courteous and unassuming man, he was very popular with his patients. He was a well-known member of the Masonic Order. The greatest sympathy is felt for his widow, as Mr. Richards was married only in February last. He was buried on Dec. 7th in his native place.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.1.

Tuesday, Dec. 17th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for Election to the Fellowship. (Names already circulated.)

MEETINGS OF SECTIONS.

Wednesday, Dec. 18th.

HISTORY OF MEDICINE (Hon. Secretaries—Charles Singer, Arnold Chaplin): at 5 P.M.
Papers:
Dr. Crookshank: Historical Traces of the Present Epidemic (Polioencephalitis and Poliomyelitis).
Mr. Robert Steele: Egyptian Days, their Origin and their Medical Application.

Friday, Dec. 20th.

ELECTRO-THERAPEUTICS (Hon. Secretaries—Robert Knox, Walter J. Turrell): at 8.30 P.M., at the Actinotherapeutic Department of Guy's Hospital, when the following Short Papers will be read and discussed:—
(1) A Note on the Construction of the Diathermy Machine (with demonstration): by C. M. Dowse, B.Sc., and C. E. Iredell, M.D.
(2) Diathermy in Gynæcological Cases: by G. Bellingham Smith, F.R.C.S., C. E. Iredell, M.D., and A. E. Marsden, Surgeon, R.N.
(3) Personal Experiences of Burning due to Secondary Radiation: by James Metcalfe, M.D.
(4) Diathermy in Diseases of the Eye: by C. Meadows Ryley, Surgeon, R.N., and C. E. Iredell, M.D.
(5) The Diathermy of the Abdomen: by C. E. Iredell, M.D., with a Note by W. H. Barber, M.D., Captain, R.A.M.C.
(6) Diathermy and Fulguration in Malignant Disease: by Philip Turner, F.R.C.S., Lt.-Col., R.A.M.C., and C. E. Iredell, M.D.

CLINICAL
OBSTETRICS AND GYNÆCOLOGY
SURGERY: Members of these Sections are invited to attend the above meeting.

The Royal Society of Medicine keeps open house for R.A.M.C. men and M.O.'s of the Dominions and Allies. The principal hospitals in the metropolis admit medical officers to their operations, lectures, &c. Particulars on application to the Secretary at 1, Wimpole-street, London, W.1.

The Society's Office will be closed the whole of Christmas week except to Military Medical Officers.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
Clinics each week-day at 2 P.M., Wednesday, Friday, and Saturday also at 10 A.M.
(Details of Post-Graduate Course were given in issue of Nov. 30th.)

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.
Course of Lectures on Public Health Problems under War and After-war Conditions (each Lecture will be followed by a Discussion):—
WEDNESDAY, Dec. 18th.—4 P.M., Lecture XI.:—Prof. W. R. Smith: The Proposed Ministry of Health.

LONDON HOSPITAL MEDICAL COLLEGE, in the Clinical Theatre of the Hospital.
A Course of Eight Lectures on Psychoneuroses in Peace and War:—
MONDAY, Dec. 16th.—5 P.M., Lecture V.:—Capt. M. Culpin, R.A.M.C.: Schools of treatment. Exorcism; drugs; electrotherapy; persuasion and suggestion (hypnosis); removal of repressions. Present views illustrated by reference to stammering, &c.
TUESDAY.—5 P.M., Lecture VI.:—Capt. M. Culpin, R.A.M.C.: How to avoid the Censor. Word association; direct hypnosis; association on the symptoms; dream analysis.
THURSDAY.—5 P.M., Lecture VII.:—Capt. M. Culpin, R.A.M.C.: Theory of dreams; symbolism, &c.; transference of emotion; latent and manifest content.
FRIDAY.—5 P.M., Lecture VIII.:—Capt. M. Culpin, R.A.M.C.: Revival of terrifying episodes the key to treatment of most War and many pre-War Psychoneuroses. Freud's views as to mechanism confirmed; his motive power (Sex) rarely found in the War cases. The relation of Epilepsy to the Psychoneuroses.

BOOKS, ETC., RECEIVED

ALLEN (GEORGE) AND UNWIN, London.
Hospital Sketches. By Frances Lyndall. 2*s.*
Echo Personalities. By F. Watts, M.A. 4*s.* 6*d.*

BAILLIÈRE, TINDALL, AND COX, London.
The Organs of Internal Secretion: their Diseases and Therapeutic Application. A Book for General Practitioners. By I. G. Cobb, Temp. Capt., R.A.M.C. 2nd ed. 7*s.* 6*d.*
Physical and Occupational Re-education of the Maimed. By J. Camus and Others. Translation by W. F. Castle, Surgeon, R.N., with articles by Sir A. Pearson and Others. 5*s.*

BALE, JOHN, SONS, AND DANIELSSON, London.
Arthrometry. By W. W. Falconer. With Foreword by R. Fortescue Fox, M.D. 2*s.* 6*d.*

BUTTERWORTH AND CO., London, Winnipeg, and Sydney.
Kala-azar. By E. Muir, M.D. With Foreword by Sir L. Rogers, I.M.S. Rs. 2.
Modern Chemistry and Chemical Industry of Starch and Cellulose (with Reference to India). By Tarini Charan Chaudhuri, M.A. Rs. 3.12.

CASSELL AND CO., London, America, and Australia.
Materia Medica and Therapeutics. By J. Mitchell Bruce and W. J. Dilling. 11th ed., revised to correspond with the War Amendments of July, 1917, and March, 1918. 9*s.*

KIMPTON, HENRY, London.
Concerning Some Headaches and Eye Disorders of Nasal Origin. By G. Sluder, M.D. 35*s.*

LANE, JOHN, London and New York.
Casting Out Fear. By Flora B. Guest. 3*s.* 6*d.*

LIPPINCOTT (J. B.) COMPANY, London and Philadelphia.
Diseases of the Heart and Aorta. By A. D. Hirschfelder, M.D. With Introduction by L. F. Barker, M.D. 3rd ed., revised. 30*s.*
Hygiene of the Eye. By W. C. Posey, M.D. 18*s.*
Forced Movements, Tropisms, and Animal Conduct. By J. Loeb, M.D. $2.50.
Training and Rewards of the Physician. By R. C. Cabot, M.D. 5*s.*

MACDONALD, ERSKINE, London.
Musings of a Medico. By Kenneth Rogers, M.D. 3*s.* 6*d.*

OXFORD PRESS WAREHOUSE, London.
Operative Treatment of Chronic Intestinal Stasis. By Sir W. Arbuthnot Lane, Bt., C.B. 4th ed., revised and enlarged. 20*s.*

SANITARY PUBLISHING COMPANY, London.
Notes on Meat and Food Inspection for Sanitary Inspectors. By J. T. Cowderay. 2nd ed. 2*s.* 6*d.*

Vacancies.

For further information refer to the advertisement columns.

Alton, Hants, Lord Mayor Treloar Cripples' Hospital.—Asst. Res. M.O. £200.
Barnstaple, North Devon Infirmary.—H.S. £150.
Barrow-in-Furness, North Lonsdale Hospital.—Second H.S. £250.
Birmingham General Hospital.—Res. S.O. £180.
Cardiff, King Edward VII.'s Hospital.—H.S. £200. Also Student Dresser. 52 gs.
Dudley, Guest Hospital.—Hon. Surg. Staff.
Evelina Hospital for Children, Southwark, S.E.—H.P. and H.S. £160.
Folkestone, Royal Victoria Hospital.—H.S. £200.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—1st and 2nd H.S.s. £175 and £150 respectively.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. 30 guineas.
Leeds General Infirmary.—Res. Aural Officer. £100.
Liverpool, Brownlow Hill Poor-law Hospital.—Asst. M.O.s as Locum Tenens. £7 7*s.* per week.
Middleton-in-Wharfedale Sanatorium, nr. Ilkley.—Asst. Res. M.O. £325.
Oxford, Radcliffe Infirmary and County Hospital.—H.P. £200.
Paisley Corporation Infectious Diseases Hospital.—Res. M.O. £250.
Putney Hospital, Lower Common, S.W.—Res. M.O. £150.
Royal London Ophthalmic Hospital, City-road, E.C.—Refrac. Asst. £100.
St. Bartholomew's Hospital.—M.O. for X Ray Department.
St. Peter's Hospital for Stone, &c., Henrietta-st., W.C.—Jun. H.S. £75.
Salisbury General Infirmary.—Asst. H.S. £150.
Sheffield Royal Infirmary.—Two H.S.'s. £150.
Southampton Free Eye Hospital.—Asst. Oph. Surg. £100.
Southampton, Shirley Warren Infirmary.—Res. Asst. M.O. £250.
Whitehaven and West Cumberland Infirmary.—Res. H.S. £150 to £180.
Winchester, Royal Hampshire County Hospital.—Jun. Res. M.O. £250.

Births, Marriages, and Deaths.

BIRTHS.

BLAXLAND.—On Dec. 7th, at Newmarket-road, Norwich, the wife of A. J. Blaxland (Major, R.A.M.C., T.F.), of a son.
BRADFORD.—On Dec. 2nd, at Churchfield, Acocks Green, the wife of Captain E. C. Bradford, R.A.M.C. (T.F.), of a son.
BROMLEY.—On Dec. 4th, at the Warden's House, Guy's Hospital, the wife of Captain Lancelot Bromley, R.A.M.C., of a son.
BROWN.—On Dec. 3rd, at Bruntsfield-place, Edinburgh, the wife of Major William Brown, R.A.M.C., of a son.
HODDER.—On Dec. 6th, at Harlyn Bay, Padstow, Cornwall, the wife of Major (temporary Lieutenant-Colonel) A. E. Hodder, D.S.O., R.A.M.C. (T.), of a son.
WOODS.—On Dec. 3rd, at Devonshire-street, W., the wife of Captain R. Salisbury Woods, R.A.M.C., of a son.

MARRIAGES.

CHAMBERS—ALDERSON.—On Nov. 30th, at St. Mary Abbots, Kensington, Lieutenant-Colonel Guy Oldham Chambers, R.A.M.C., to Adèle Maude, widow of Lieutenant A. R. Alderson, R.E., of Cirencester.
MACALISTER—STALKER.—On Dec. 7th, at St. Andrew's United Free Church, Edinburgh, Charles John Macalister, M.D., Rodney-street, Liverpool, to Mary Leslie, youngest daughter of the Rev. Professor Stalker, D.D., Aberdeen.

DEATHS.

COSTOBADIE.—On Dec. 3rd, at The Cedars, Midsomer Norton, Hugh P. Costobadie, F.R.C.S., aged 58.
DAVIS.—On Nov. 2nd, at Delft, Holland, of septic pneumonia, George Makins Davis, A.B., *Benbow* Battalion, R.N.D., in his 23rd year, beloved second son of Dr. G. W. Davis (temporary Captain, R.A.M.C.) and Mrs. G. W. Davis, Dunelm, Sidcup, Kent.
FOSTER.—On Dec. 2nd, on board Hospital Ship *Amara*, Captain Norman K. Foster, R.A.M.C.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

COLONIAL HEALTH REPORTS.

Falkland Islands.—In 1917 the total recorded number of births was 61, of deaths 16, and of marriages 17, as compared with 52, 23, and 29 respectively in the previous year. The birth-rate per 1000 in 1917 was 18·82, and the death-rate 4·93, as compared with rates of 16·14 and 7·14 respectively in 1916. The estimated population of the colony (including South Georgia) on Dec. 31st, 1917, was 3236—2264 males and 972 females. The general health was excellent—better than during the two previous years. Twenty-one cases were admitted to the King Edward VII. Memorial Hospital—12 males and 9 females, 5 of the latter being maternity cases. There were at the end of the year three inmates of the infirmary section (Victoria Cottage Home).

Seychelles.—The Blue-book for 1917 gives the estimated population as 24,528, an increase of 419 as compared with the previous year. The birth-rate was 29·31 per 1000, and the death-rate 20·63 per 1000. The total number of patients treated in the Victoria Hospital during the year was 684; and 3198 patients were treated in the different Government dispensaries. During the last month of 1917 an epidemic of measles of a mild type broke out and continued far into the present year. The principal event of medical interest in 1917 was the return of the Seychelles Labour Force from East Africa in May. The force originally consisted of 791 men; 250 died in East Africa, and it was decided to repatriate the force on account of ill-health. As most of the deaths have been due to dysentery of a bacillary type, which is very virulent and up to that time unknown in Seychelles, steps were taken to quarantine the force on arrival. The general health of the men was then found to be far from satisfactory; the principal diseases were dysentery, pneumonia, malaria, and beri-beri; 25 deaths took place in the quarantine station. At the end of 15 days the acute cases, 15 in number, were removed to hospital and the balance liberated from quarantine. Even afterwards bacillary dysentery broke out in South Mahé in the family of a returned porter, but the prompt measures taken stamped out the disease before it could spread further. Many of the men still continue to have attacks of malaria and several are suffering from septic ulcers which are very resistant to treatment. In all there were 327 deaths amongst the force, a mortality of 41 per cent. A campaign against ankylostomiasis was started by Dr. J. F. Kendrick under the auspices of the International Health Board, and by the end of the year treatment had been accorded to all residents in two-thirds of the Island of Mahé. The campaign is carried ont by means of a house-to-house visitation, all who are infected being treated. 90 per cent. of the people have been found to be infected and all classes offered themselves for treatment with great keenness. A law was passed enforcing the provision of latrines on all buildings used for habitation, and this should mitigate the danger of re-infection.

ASCLEPIOS AND ESHMUN.

THE identity of the Phœnician deity Eshmun with Asclepios is assumed as proved in most recent works upon the early history of medicine, and is in agreement with the views of classical authors. There is in existence on a monument an epigraphical record earlier than any classical manuscript, though perhaps not pre-dating the era of the writers, which may be said to definitely decide the matter. This is a trilingual inscription dating from about 180 B.C., proving that, in the opinion of the man who had the text engraved, the deities were varied names for one god. This person was well educated, because he seems to have been conversant with the Punic, Greek, and Hebrew languages. Moreover, he resided in Sicily; therefore, in a country where the facts as to such an identity would be most correctly known.

The inscription referred to may be perused in Vol. I. of the Corpus of Semitic Inscriptions, No. 143, or seen in its present place in the Turin Museum. The Latin and Greek versions are as follows: "Cleon salari(us) soc(iorum) s(ervus) Aesculapio Merre, donun dedit lubens merito merente." "Ἀσκληπίῳ Μηρρὴ ἀνάθεμα βωμὸν ἔστησε Κλέων ὁἐπὶ τῶν ἁλῶν κατὰ πρόσταγμα."

For the translation of the Punic text we quote that of the Rev. G. A. Cooke, M.A. "The lord Eshmun Merre:—the altar of bronze in weight 100 pounds which Cleon of HSGM; who is over the salt mines; vowed; has heard his voice (and) healed him. In the year of the Suffetes Himilkath and Abdeshmun son of Himilk."

This monument was discovered near a thermal spring. In another inscription referring to Eshmun found at Sidon a prince, Eshmunazar, says "he erected a house for that deity near the well of Yidlal in the mountains."

THE "WELLCOME" PHOTOGRAPHIC EXPOSURE RECORD, 1919.

THIS popular and useful little book is at once a guide to photography and a pocket diary for photographers. Having the features of previous editions most things which the photographer requires to know will be found in its pages. The exposure metre on the inside of the back cover has been made more convenient, the correct exposure now appearing opposite each stop. The book should make a useful Christmas present, as the recent withdrawal of restrictions against photography will no doubt lead to a revival among amateurs of this popular art. The price is 1*s.* 6*d.*

WESTON-SUPER-MARE HOSPITAL.

AT a public meeting recently held at Weston-super-Mare it was decided that the war memorial should take the form of a suitable monument and the erection of a new wing to the Weston-super-Mare General Hospital.

AT the last meeting of the Devon education committee it was stated that 27 per cent. of the parents refused to allow their children's teeth to be treated by the dental surgeon. It was suggested that compulsion was necessary, and that the Prime Minister of the new Parliament should be petitioned on the matter.

EDITORIAL NOTICES.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

We cannot undertake to return MSS. not used.

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2

Communications, Letters, &c., to the Editor have been received from—

A.—Dr. J. V. Arkle, Kalgoorlie; Surg.-Lieut. W. M. Ash, R.N.

B.—Mr. J. C. Brownbridge, Witton-le-Wear; Prof. P. Boveri, Milan; Mr. J. Best, Lond.; Dr. G. Blacker, Lond.; Messrs. Butterworth and Co. (India), Calcutta; Dr. E. F. Buzzard, Lond.; British Fire Prevention Committee, Lond.; Messrs. C. Barker and Sons, Lond.; Dr. C. Burland, Liverpool; Buxton and High Peak Medical Association, Hon. Sec. of.

C.—Lieut.-Col. A. Castellani, Lond.; Coal Mines Department, Lond.; Major F. W. Crew, R.A.M.C.

D.—Dr. V. Dickinson, Lond.; Mr. H. Dickinson, Lond.; Mr. H. C. Davidson, Tadley.

E.—Dr. H. A. Ellis, Middlesbrough.

F.—Miss M. Fitzgerald, Lond.; Dr. R. F. Fox, Lond.

H.—Mr. W. Heinemann, Lond.; Mr. F. P. Hardenstein, Washington; Capt. R. A. Hooper, R.A.M.C.(T.); Mr. E. Henderson, Hatch End; Sir W. P. Herringham, C.B., Lond.; Dr. J. Haddon, Denholm; Capt. D. T. Harris, R.A.M.C.; Messrs. C. J. Hewlett and Son, Lond.; Mrs. K. W. Hodgson, Treharris.

I.—*Indian Medical World*, Calcutta; Illuminating Engineering Society, Lond.

J.-Lt.-Col. A. L. Johnson, C.A.M.C.

K.—Mr. D. N. Kalyanvala, Lond.; Mr. W. H. Kesteven, Kingston Hill; King's College Hospital Medical School, Lond., Sec. of.

L.—Mr. E. Lee, Blackrock; Messrs. Longmans, Green, and Co., Lond.; Dr. C. Lillingston, Peppard Common.

M.—Dr. J. B. Mennell, Lond.; Mr. W. Miles, Lond.; Lieut.-Col. F. F. MacCabe; Bde.-Surg.-Lieut. Col. A. B. R. Myers, Lond.; Mr. J. Y. W. MacAlister, Lond.; Mr. C. MacMahon, Lond.

N.—Mr. R. Nichol, Glasgow; Capt. H. P. Nottage, M.C., U.S.A.; Major W. E. Nickolls, R.A.M.C.

O.—Overseas Military Forces of Canada, Lond., D.G.M.S. of; Dr. T. T. O'Farrell, Dublin.

P.—Miss K. Pilkington, Lond.

R.—Royal Surgical Aid Society, Lond.; Royal Academy of Medicine in Ireland, Dublin; Dr. B. Robinson, New York; Dr. H. Rainy, Edinburgh; Dr. W. H. R. Rivers, Lond.; Royal Society, Lond.; Rt. Hon. Earl of Ranfurly, P.C., G.C.M.G.

S.—Dr. H. B. Shaw, Lond.; Society of Public Analysts, Lond., Joint Hon. Sec. of; Scientific Press, Ltd., Lond.; Major R. S. Skirving, A.A.M.C.; Dr. S. Samuel, Leeds; Dr. G. F. Still, Lond.; Mr. J. R. Skinner, Bishop's Teignton.

T.—Dr. C. J. Thomas, Lond.; Capt. A. J. Turner, R.A.M.C.; Médecin-Major Thomson; Mr. J. P. Toogood, Guildford.

U.—University of London Unionist Association, Lond.

V.—Dr. F. Villy, Keighley; Dr. C. W. Vining, Leeds.

W.—Dr. W. H. Wynn, Birmingham; Dr. H. Wilson, Lond.; Dr. C. Wood, Frimley; Mr. L. F. Wintle, Lond.; Mr. E. A. West, Lond.; Dr. L. A. Weatherly, Bournemouth; Dr. H. Woods, Lond.; West London Hospital Post-Graduate College, Lond.

The following journals, magazines, &c., have been received:—Archives de Médecine et Pharmacie Navales, American Journal of Surgery, St. Bartholomew's Hospital Journal, Annali d'Igiene, Dublin Journal of Medical Science, Indian Medical Gazette, Edinburgh Medical Journal, Revista Clinica, Lyon Chirurgical.